AFIT/GIR/LAL/99D-4

IMPACT OF ACTUAL FACILITATOR ALIGNMENT, CO-LOCATION AND VIDEO INTERVENTION ON THE EFFICACY OF DISTRIBUTED GROUP SUPPORT SYSTEMS

THESIS

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THESIS

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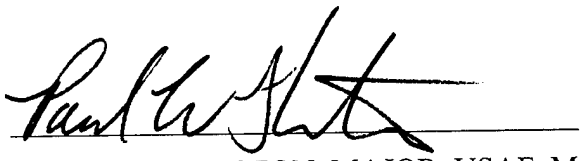

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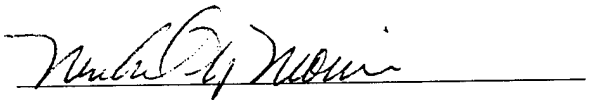

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Abstract

The growth of distributed group support systems (GSS) suggests that organizations will continue to bring dispersed groups of people together to make decisions over computer networks. In many instances those groups are temporarily assembled to address a task and then summarily disbanded never to work together again. In order for users to effectively use the GSS, issues of trust and control need to be addressed within the GSS design. Users have perceptions about the fairness of structural and social determinants of the GSS design. These perceptions influence both the decision-making process and process outcomes. This article shows the negative impacts that facilitator alignment and co-location with a single meeting member has on the other group members' perception of GSS fairness and equality of power distribution. This study also demonstrated how video can effectively reduce or mitigate the negative justice perceptions that users experience from facilitator alignment and co-location. The findings suggest that the increased communications capabilities available from video can help users overcome limitations that would otherwise be present from the design.

IMPACT OF ACTUAL FACILITATOR ALIGNMENT, CO-LOCATION AND VIDEO INTERVENTION ON THE EFFICACY OF DISTRIBUTED GROUP SUPPORT SYSTEMS

I. Introduction

The forecast for the future of computing emphasizes the concept of interconnection, not only of information, but also of people (LeeBaert & Dickinson, 1991: 295,297). Computer-mediated group support systems have been developed to provide structured group communications and decision-making processes to improve group interaction, thereby providing higher quality outcomes of decisions (Anson, Bostrom, & Wynne, 1995:190).

Research on group support systems has primarily focused on the efficiency realized by the technology and the abilities of the facilitator as they impact the meetings of face-to-face groups (Nunamaker, Briggs, Mittleman, Vogel, & Balthazard 1997: 202, Anson et al., 1995:200-201). The future of GSSs reside in their potential to provide a means for geographically separated decision-makers to meet and work in a virtual environment is now of great interest to Information Systems (IS) professionals. Given that there has been little investigation into the social dynamics of distributed meeting members over a GSS, this area of research is worthy of attention (Nunamaker et al., 1997: 202).

1.1 Background

A group support system (GSS) is a computer-based "social technology," (Turoff et al., 1993: 400) the basic purpose of which is "to increase the effectiveness of decision groups by facilitating the interactive sharing and use of information among group members and also between the group and the computer (Huber, 1984: 186)." The GSS combines computer hardware and software with human facilitation (Turoff et al., 1993: 400), to increase the effectiveness, efficiency, and satisfaction of decision-making groups (Nunamaker, 1997:360).

A GSS will normally increase participation allowing all meeting members to participate fully without regard to criticism, since idea generation can be anonymous (Jessup, Connelly, and Galagher, 1990:319). In this atmosphere, ideas are evaluated on their merit rather than on the source of the idea. Since ideas are typed directly into the computer, they are automatically documented and quickly organized. The meeting facilitator administers the GSS, and in so doing allows the user to rapidly employ the technology in an effective manner. However, the role of the facilitator extends beyond the operation of the GSS. Facilitators are also responsible for aiding the group leader to identify objectives and develop an agenda for the meeting (Nunamaker et al., 1997: 192-193).

Previous research has shown that attributes of the facilitator and the systems design can influence the perceptions and social interactions of the individual group members (Lea, 1998). Specifically, GSS designs that reduce the levels of trust and perceived control also tend to lower each participant's sense of fairness and satisfaction, as well as their degree of participation in the decision making process (Lea, 1998). Lea

(1998) found that users had problems with the group experience if they thought the facilitator favored one member of the group. Lea referred to this as *alignment.* Lea (1998) also found that group members disliked configurations where the facilitator was physically co-located with one of the group members. Co-location was defined as the facilitator situated in the same room as one meeting member versus a separate facility.

1.2 Research Applicability to the United States Air Force

Decision-makers within the Air Force are continually faced with not only a reduction in manpower and material budgets, but also a demand for flexible, cost-effective operations. Reduced business-cycle times and improved process efficiencies are becoming increasingly critical to Air Force effectiveness (Air Force Research Laboratory Sustainment Logistics Branch, 1999:1). One result of the Air Force's quest to streamline its logistics infrastructures and processes in response to budgetary constraints encountered during the late 1980's, has been the implementation of Lean Logistics (Office of the Secretary of Defense, 1996:23).

The Lean Logistics program focuses on improving operational units' capabilities by applying modern business practices across all logistics functions and processes. The program suggests the use of just-in-time asset management and repair systems instead of the traditional demand-driven, just-in-case asset management systems. The Air Force is advancing innovative concepts, such as the use of information systems, to support Lean Logistics in providing effective and less costly depot-level maintenance operations (Office of the Secretary of Defense, 1996:22-25, Office of the Secretary of the Air Force, 1997).

With DoD's focused logistics and the Air Force's agile combat support initiatives, the logistics community must continually re-evaluate the processes used to support the warfighter. The emphasis on cost-cutting has also placed considerable pressure on logistics units at the base and depot levels to streamline their operations. In addition, depots are facing increased competition from commercial firms for aircraft repair and maintenance business. As a result, Air Force logistics units are confronted with the need to change their processes in the direction of Lean Logistics in order to succeed in this increasingly competitive and dynamic environment. Implementation of Lean Logistics concepts will require increased communication and collaboration among the affected units (Air Force Research Laboratory Sustainment Logistics Branch, 1999:1-2, Air Force Research Laboratory Sustainment Logistics Branch, 1998).

In support of Lean Logistics, the Air Force Research Laboratory (AFRL) has developed a distributed computer-mediated decision support system to allow maintenance depots, base logistics units, and command headquarters to accomplish process redesign in an any-place and any-time environment. The system is composed of two programs. The first is called RAPTR, or Readiness Assessment and Planning Tool Research. RAPTR, not in itself a distributed GSS, provides a business process reengineering toolkit intended to assist logisticians and managers in implementing changes within their organizations. The program will identify processes for reengineering and offer remedies to address them. (Air Force Research Laboratory Sustainment Logistics Branch, 1998:2).

The second component of the proposed system is the Depot Operations Modeling Environment, (DOME). It is this component which will utilize the distributed GSS

technology. The goal of the DOME system is to aid in the design and modeling of Air Force logistics processes using a collaborative environment which establishes connectivity between dispersed groups and installations. The DOME system relies heavily on an existing commercial product known as GroupSystems® developed by the University of Arizona. Many of the tools developed for the DOME project extend the capabilities GroupSystems® to offer greater functionality. The DOME system has been successfully installed and demonstrated at the Warner-Robins ALC, Robins AFB, Georgia and the 366th Wing at Mountain Home AFB, Idaho. (Final Dome, Air Force Research Laboratory Sustainment Logistics Branch, 1998:2)

1.3 Problem Statement and Purpose of Research

The specific concern of this study was whether facilitators need to be a neutral and physically isolated party in order to adequately facilitate a distributed GSS meeting. The cost and availability associated with this configuration are considered problematic for systems like DOME and RAPTR. The purpose of this study is to replicate Lea's findings, and determine what effects the use of video may have in neutralizing perceptions of intent and ability to bias in untrusting group members.

In previous research, Lea found that the facilitator, having "super-user control over the meeting process" (1998:5), is both a technology enabler as well as an aid to the GSS user. Additionally, alternate states of location and alignment have the potential to moderate a facilitator's use of power. Co-location with one member of the decision-making group, affords the facilitator the opportunity to give special assistance or provide information to that member during meetings without alerting other group members

(Bostrom et al., 1993:159). Correspondingly, group member perceptions of the relative fairness of the meeting process and meeting outcomes will be influenced by aspects of the GSS structure, the social interactions enabled and moderated by the GSS (Lea, 1998:5), and the visual social cues provided by video-conferencing.

Engineers at AFRL are concerned that an arrangement in which the meeting facilitator may be aligned or co-located with a group member might negatively impact the group dynamic, resulting in a general distrust of the meeting process among the distributed group members. However, issues such as cost and availability may be problematic when securing the services of a neutral party to act as a facilitator for distributed meetings. In addition, the hired facilitator will have access to any sensitive information, which might be discussed or presented in these sessions (Anson et al., 1995:205). "The preferred system design from an engineering and cost perspective is that in which the meeting facilitator is drawn from the organization of some represented constituent and is co-located with that meeting member" (Lea, 1998:5). Nevertheless, Lea's findings suggest that this design can have a detrimental impact on the decision-making group's interaction and performance.

The use of video as a component of the GSS design has the potential to mitigate the negative effects of perceived bias at a substantially lower cost to the organizations that must use a distributed GSS like the DOME and RAPTR system. This study hopes to provide supporting evidence of the utility of video in a distributed environment for group decision makers.

1.4 Summary

Advances in networking technology have expanded the capability of the GSS to extend beyond the traditional face-to-face environment of the conference room. The GSS is now able to provide distributed collaboration in a virtual environment. Engineers at the Air Force Research Laboratory's Sustainment Logistics Branch are interested in the technology's ability to bring together geographically separated participants in the redesign of logistics processes. Although technically feasible, little is understood about the impact of the distributed GSS configuration on dynamics of the virtual group. This study will serve to reveal this dynamic, by evaluating the impact of facilitator alignment, co-location, and video intervention on the efficacy of a GSS when deployed in a distributed environment.

1.5 Sequence of Presentation

Chapter II of this thesis provides a review of the relevant literature from the body of GSS research with emphasis on literature, which pertains to the dependant variables studied in this thesis. Chapter III focuses on the methodology used to conduct the research for this study. The data collected and the results of this study are presented in Chapter IV. Finally, Chapter V will interpret the data with respect to the hypotheses that were investigated with this study. The findings will be presented with the conclusions, limitations, and recommendations for future research in this exciting area of collaborative communications.

II. Literature Review

2.1 Introduction

Decision-making is one of the primary purposes of the group in our society. Groups use communication as an organizing element through which, humans can process information, test ideas, and exchange opinions to achieve consensus on a decision. Through the sharing of information, humans develop interpersonal relationships and "form groups from aggregates of individuals" (Fisher, 1980;xi).

A group is defined as two or more persons interacting in such a manner as to mutually influence one another (Fisher, 1980:17). In order for a group to exist, each member must share a common purpose. The common purpose that binds each member to the group "is inevitably a choice made by group members from among alternative proposals available to them" (Fisher, 1980:128). Shared goals compete and often conflict with the individual goals of each group member. Ultimately, the effort put forth by each member, and the overall effectiveness of the group will depend on the extent that individual group members subordinate their individual goals to the common goal of the group.

In order for groups to make *rational* decisions, complete and accurate information must be shared among group members. The group meeting allows members of a group to share information, to interact, and to learn something new. Thus, the generation and sharing of ideas and information are an important motivation for people to join together in meetings (Mennecke, 1997: 387). However, studies have shown that decision-makers often do not analyze all alternatives or consider the consequences of chosen alternatives.

"Although decision makers try to be rational, they are constrained by limited cognitive capabilities and incomplete information, and thus their actions may be less than completely rational in spite of their best intentions and efforts" (March, 1994:8-9).

While information is necessary for rational decision making, decision-making groups have constraints on their ability to process that information. These include constraints on *"attention, memory, comprehension, and communication"* (March, 1994:9). Since time and capabilities are limited, information signals must compete for a member's *attention*. Although many items are relevant to a decision, they cannot all be analyzed at once. A second limitation in most individuals is storage space in the form of *memory*. This includes not just the recording of data but the ability to retrieve it effectively when needed. Group decision-makers also face the challenge of effective *comprehension*. Many decision-makers have shown they cannot effectively arrange, condense, and use information. In some cases, the decision-maker may have possessed useful information, but failed to see its relevance. Finally, the problem of *communication* suggests humans have limited capacities for effective information transfer (March, 1994:9-10).

To cope with these limitations, groups use alternate frameworks to screen, discard, encode and add priority to information received (March, 1994:10). These frameworks often require simplifications of complex situations and the creation of expectations for future interactions. For communication among group participants, these frameworks often include judgements about the value of information and trust in the source of the information.

The struggle of decision-makers to effectively overcome these limitations, facilitates the need for a basic framework to accommodate these difficulties (March, 1994:10). The framework must address the *process* and *content* of group communication. Groups interact and work together by virtue of a *process* and that *process* consists of "how members talk to each other, how they identify and solve problems, how they make decisions, and how they handle conflict" (Schwarz, 1994:5). A secondary, but still important concept of the group discussion is *content*. *Content* refers to nothing more than what the group is working on (Whittaker et al, 1997:25 and Schwarz, 1994:5).

The design of the GSS directly targets the process of group communication. Proponents of Group Support Systems (GSS) tout the ability of the technology to improve the generation and sharing of information (Nunamaker, 1997: 357) and thus reduce the impact of communication constraints. However the GSS is not a panacea. The structure and interactions inherent in a GSS produce problems that are not readily apparent in face-to-face working groups. Users of the GSS must subordinate their own control over communication to the system and the facilitator. Subordination requires trust in the structure of the system and in the social interactions mediated by the facilitator. The levels of trust place constraints on the utility of the GSS and ultimately the effectiveness of the decision-making group.

This chapter discusses the role of trust, as well as the influence of facilitation on group processes and performance. It will also explore GSS and video-mediated communications research to show the technology's ability to support decision-making

groups. Finally, this chapter presents the theoretical basis and the hypotheses investigated for the research contained in this study.

2.2 Trust and the Group Process

Research suggests there are two distinct components of trust -- being trusted and trusting others. Individuals like being trusted because it shows that others value their ability to manage or control resources. Competing with this positive feeling of being trusted is a discouraging feeling associated with having to trust others. Individuals dislike having to allow other people to manage or control resources that are important to them (Kramer and Tyler, 1996:40). This dichotomy creates an important role for trust in the decision-making group (March, 1994:110). According to Gulley and Leathers, "Interpersonal trust is that relationship that exists when the interactants base their behavior on the expectation and prediction that each will act in mutually beneficial ways as they strive to achieve objectives that involve some degree of risk (1977:213)." This is activity is often made more difficult by the fact that individual and group goals in a specific situation may substantially differ or even conflict. Members must often ask themselves whether actions of other members are for the benefit of themselves or for the group.

Where collaboration is concerned, trust is critical because one member of a group must "trust the other's information and trust that the other will not exploit oneself" (Kramer et al, 1996:276). Trust is reported to reduce transaction costs, because individuals are less apt to act in a self-protective fashion in response to others' opportunistic behavior (Kramer et al, 1996:4). Trust also increases confidence in the

group relationship and promotes open information exchange (Earley, 1986: and Frost, Stimpson, & Maughan, M.R.C., 1978). It is apparent that trust is a characteristic of every successful decision-making group. Without it, groups are destined to substandard performance (Fisher, 1980:33).

Adding to the complexity of trust is the fact that numerous groups are temporarily formed to make a decision or determine a course of action and then they are disbanded. Not only do they have limited time to determine "who knows what" but they are missing traditional sources of trust such as shared experiences or team familiarity (Kramer, 1996:167). With the obvious importance of trust and the temporary nature of groups, the question then becomes how do group support systems overcome these limitations.

According to Kramer et al. (1996:401), trust is impacted causally by procedural justice. A decision-making group that perceives procedural justice to be fair will tend to elicit a higher level of trust (1996:401). The authors go on to state "Procedural justice depends on the structure as well as the interpersonal behavior of the implementers of the decision" (Kramer et al., 1996:403). With this in mind, GSS designers should incorporate in its process and structure, aspects that deal with procedural justice in order to increase trust levels.

2.3 Influence of Facilitation on Group Processes and Performance

It can be appreciated that groups collectively achieve outcomes that individuals alone cannot accomplish. Yet all groups do not achieve the synergistic effects of group activity. Some groups function in ways that may lead to ineffective performance, as well as group member frustration. Since, groups often find it difficult to openly examine their

own behavior, the introduction of the facilitator serves as an avenue to improve the way a group works (Schwarz, 1994:4).

Facilitation in its ideal form can be viewed as a set of functions or activities carried out by a person who is perceived as acceptable to all members of the group, substantively neutral, and has no decision-making authority. Facilitator functions occur before, during, and after a meeting, thus the perceptions of neutrality must be maintained throughout the entire period of interaction with the group. The facilitator's essential characteristic is to help make a group more effective and their outcome easier to achieve (Bostrom, Anson & Clawson, 1993: 147 and Schwarz, 1994:4). As stated by Schwarz, it is important for the facilitator to have no decision-making ability. The facilitator should not show a preference for any solution the group identifies -- "The facilitator's client is the entire group, not certain members" (Schwarz, 1994:5). The facilitator should not aid one group member at the expense of another, or accept a viewpoint from a single member as representative of the group (Schwarz, 1994:5).

Members of a group implicitly invite a facilitator to be impartial when they ask the facilitator to mediate (Schwarz, 1994:15-18). Therefore, the facilitator's main focus should be increasing the effectiveness of the group by improving its process (Schwarz, 1994:5). Neutral facilitators, those whose clients are the entire group, engender trust from all the group members. These members realize that the facilitator will not take advantage of them to serve other's interest or the facilitator's own (Schwarz, 1994:254).

Perfectly neutral facilitation is often an impractical if not an impossible situation. Neutrality exists in the perceptions of the group members, not as an attribute inherent in the facilitator. A facilitator can act in an unbiased manner, and still appear to be

providing aid to a subset of the group members. The task of the designer and the facilitator is to "appear neutral" to all members of the group.

2.4 GSS Research

"A group support system is a set of techniques, software, and technology designed to focus and enhance the communication, deliberations, and decision making of groups" (Nunamaker, 1997: 357). The systems referred to as GSSs have also been called many other names through the years to include Group Decision Support Systems, Electronic Meeting Systems, Computer-Supported Collaborative Work, and Computer-Mediated Communication Systems. (Jessup and Valacich, 1993: 6)

Research into GSS is now well into its second decade and continues to be a growing research area (George & Jessup, 1997: 497). Rudimentary computer communications and decision support systems research in the early 1970s has now developed into a full research field within the academic discipline Management Information Systems (Dennis & Gallupe, 1993: 59).

The roots of empirical GSS research can be found in the early computer messaging and decision support system (DSS) research. The research of the 1970s demonstrated that using computers as a medium for information exchange is quite different from face-to-face exchange. Although, DSS was found to be useful in individual decision-making, little was done in the realm of group support.

The 1980s brought about the first exploratory studies into computer-based group support. Researchers of this period focused on developing a viable group support system, in order to increase group productivity in a same-time/same-place setting (Nunamaker, et

al, 1997:169 and Dennis & Gallupe, 1993: 64). The basic lessons learned during this time were "(1) GSS has the potential to improve group processes, (2) better GSS must be developed if these systems are used, and (3) more rigorous research is needed before the impacts of the use of this technology is understood (Dennis & Gallupe, 1993: 64)."

The "Early Experiments" of the late 1980s, conducted exclusively in laboratory settings, contrasted GSS and non-GSS supported groups with mixed results. "Some experiments showed improved decision quality, whereas others showed no effect or worse decision quality for groups using a GSS compared to those who did not" (Dennis & Gallupe, 1993: 66). In contrast to the inconclusive results received from laboratory studies, "Field Studies" research deployed the GSS technology for use in the practitioner's environment. The studies of GSS use in the field have generally found positive reactions. Curious as to the cause, researchers suggested that GSS field use was different from GSS laboratory use. Many field studies involved large groups of managers and professionals performing complex tasks over several days, and in most cases aided by a process facilitator. In contrast, most laboratory experiments included unaided, small groups of students completing less complex tasks over a short period of time (Dennis & Gallupe, 1993: 68).

By the 1990s, professionals active in the field of GSS research had become sensitive to the potential of facilitation to help groups employing GSS. Work conducted since has largely shifted away from the investigation of the capabilities of the GSS technology itself, to focus instead on the dynamics of facilitating GSS supported meetings (Lea, 1998:11). Since this time, a meta-analysis of 29 experimental studies comparing GSS supported and non-GSS supported groups has found that GSS

technology improves decision quality and increases equitable participation, with a cost to group confidence and satisfaction (Anson, Bostrom & Wynne, 1995: 190-191). This study proposes that meeting support, and structure, can lessen the costs to participants' confidence and satisfaction, if they are designed to increased levels of trust in the system and individual control over the process. It is this paper's position that it is the lack of confidence and satisfaction, which places constraints on the utility of the GSS and ultimately the effectiveness of the decision-making group. Careful design of the system structure, attention to perceptions of facilitator bias, and increased individual control through things like video intervention can mitigate the lack of confidence in the system and levels of dissatisfaction with the experience.

2.4.1 Role of the Facilitator in GSS-Supported Meetings/Meeting Facilitation Framework

According to Bostrom, Anson & Clawson, "One cannot understand or manage a GSS session without focusing on facilitation" (1993: 147). The facilitator shapes and guides the meeting process and the use of the GSS. The GSS is a tool by which the facilitator and group members accomplish meeting outcomes. The authors provide a meeting facilitation framework (MFF) for researching and understanding facilitation in the GSS environment. The MFF (see Figure 2.1, next page) was developed to in an attempt to better understand and explain the dynamics of group facilitation (Bostrom, et al., 1993: 157).

According to MFF, three dimensions of facilitation influence group meetings: sources, targets and functions. Sources include GSS technology, group member leaders,

and external facilitators. These sources are initiators of facilitative acts upon targets, to include influencing how the group does its work (process), the content of work (task), and how the group works together (relationship) (Bostrom, et al., 1993: 158).

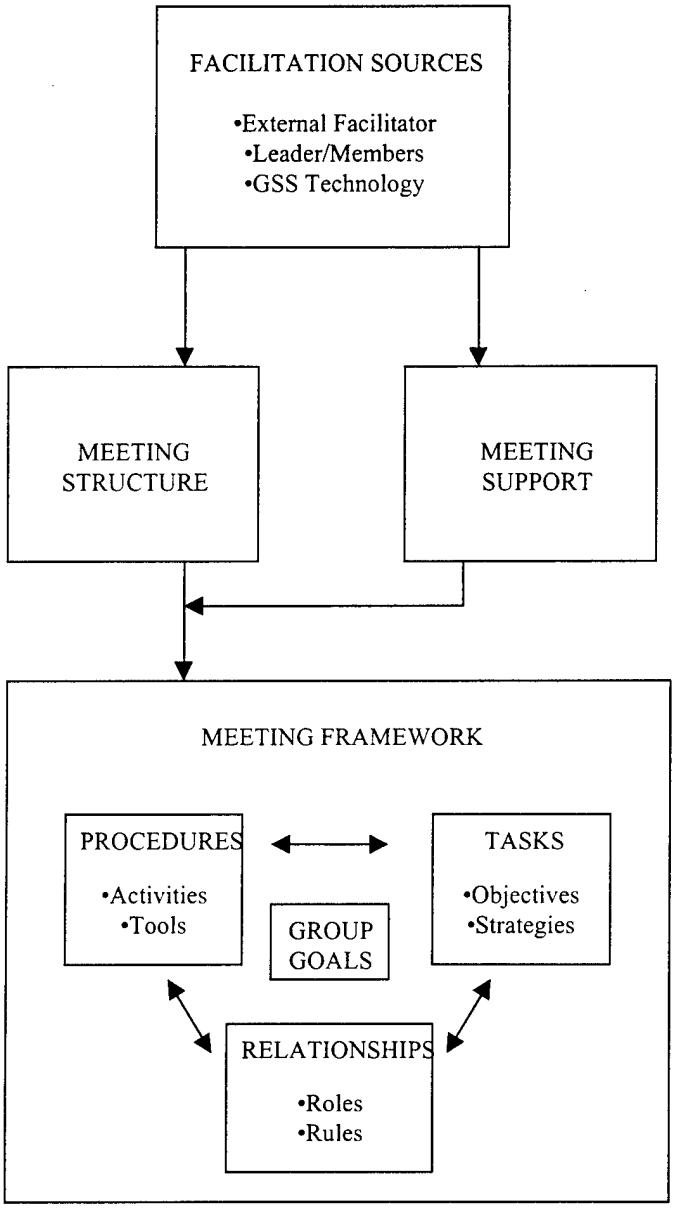


Figure 2.1 Meeting facilitation framework (adapted from Bostrom and others, 1993:146).

The facilitative acts are grouped in two general functions, structure and support. Meeting structure includes goals for meeting outcomes, procedures and techniques for accomplishing goals, rules to follow during a meeting and roles for group members to assume. It is the facilitator who uses the GSS tool to provide structure for organizing a group, assigning relevant roles and establishing the rules and procedures. Thus, users must subordinate control over communication to the GSS and facilitator (Bostrom, et al., 1993: 160-161). And in so doing may decrease levels of trust. Facilitator support activities are used to enact structures, encourage effective behavior and deal with disruptive influences (Bostrom, et al., 1993: 160-161).

MFF finally explains that the interactive effect of process, task and relationship determines group member's involvement in, and contribution to, the group process. The facilitator's design and implementation of meeting structure and support determine this interactive effect. Involvement and contribution are expected to decrease in cases where members perceive structure or support to be biased. The ultimate consequence is the quality of the process outcome (Bostrom, et al.,1993: 161-162).

2.4.2 Alternate GSS Configuration

Much of the research involving facilitated GSS has utilized the same-time/same-place setting. However, there is a need for research investigating the capabilities of facilitated GSS among distributed meeting members. "The dream of being in two places at one time became realizable with modern technologies; now, being in 10 places at once is possible through synchronous distributed applications." (Schneiderman, 1998:488) The question then becomes how do we foster trust between different GSS designs? To

determine which of four different GSS configurations would be required to facilitate effective decision making, systems need to be decomposed along a time-space matrix. (Ellis, Gibbs, & Rein, 1991:680-689)

Some GSS configurations provide face-to-face communication by co-locating members in the same room at the same time. In contrast, a GSS that uses synchronous distributed communication allows users to work at the same time, from different locations. Other forms of GSS design include asynchronous interaction and asynchronous distributed. These deal with a different time, and same location or a different time at different locations, respectively. Configurations are summarized in the table below.

Time-Space Matrix

	Same Time	Different Time
Same Place	**Co-located**	**Interaction** (Asynchronous)
Different Place	**Distributed** (Synchronous)	**Distributed** (Asynchronous)

Figure 2.2 Time-Space matrix (Alternate GSS configurations).

Technological advances allow configurations that may utilize more than one quadrant of the time-space matrix. Lea found that groups in a synchronous distributed setting, in which all group members are isolated, performed better than groups where the facilitator was co-located (face-to-face setting) with a single meeting member while the rest of the group were distributed (1998: 57-59). There was strong support that user perceptions of *equality of power distribution* and *fairness of GSS design* were better in

the synchronous *all-distributed* groups. Further, user satisfaction with the dynamics of the participant group were lower with co-location of a single meeting member and facilitator than the all-distributed groups.

In fact, the *distributed* group support system combines characteristics of computer-mediated communications systems with the same tools and processes that have been developed for traditional group support systems (Turoff, Starr, Hiltz, Baghat, & Ajaz , 1993: 399). To make a distributed workplace effective, distributed meetings have to offer more than just connectivity and data-sharing capability. Tools should be available to structure project and meeting processes, evaluate alternatives, create a shared perspective, measure consensus and develop a result in a distributed environment. More importantly, a distributed workplace should be a virtual representation of an actual work place or resemble it as closely as possible (Nunamaker, 1997:369).

2.5 Video-Mediated Communication

The importance of video-mediated communication lies in its ability and flexibility to allow meeting participants to communicate in a "different-time, different-place" or distributed environment. The major goal of video-mediated communication or videoconferencing has been the simulation of face-to-face meetings for distributed groups (Sellen, 1995: 403). This face-to-face simulation is important because, "as people speak, they gesture for emphasis and illustration, they gaze at listeners and visually monitor their environment, their facial expressions change, and their body posture and orientation shift as they talk" (Whittaker & O'Conaill, 1997:24). The receivers of this communication also respond with visual cues, gestures, facial expressions, and show attitudes of

agreement/disagreement through head movement and posture. This non-verbal communication exchange is the notion of *social presence*. (Srinivasan 1995: 252)

Social presence suggests that media having high social presence will allow personal, warm, and sensitive messages to be communicated. As such, face-to-face communication has a high social presence while e-mail, for example, would have low social presence. Therefore, in a distributed GSS mediated by video, a capacity exists to transmit information about facial expression, posture, dress, and other nonverbal cues which would all benefit the social presence of a communications medium. A lower social presence would mean a lower ability to communicate nonverbally. (Srinivasan, 1995:253)

However, some research suggests that whether or not an individual benefits from social presence depends highly on the type of task. (Anderson, Newlands, Mullin, Fleming, Doherty-Sneddon, & Van der Velden, 1996:193) Whittaker et al suggest that video should improve communication because:

1. "Video supports visible behaviors and thus supplies important nonverbal information.
2. Video provides visible information about the environment, specifically the availability of other people; this in turn facilitates connection for unplanned communications.
3. Video provides dynamic visual information about objects and events in a shared visual environment. This is important for certain collaborative tasks, an application that is referred as video-as-data." (1997:25)

The visible behaviors and information described above reference features commonly found in face-to-face communication. Features are broken down into, behaviors of the other communicative participants and information about the visible environment. The behaviors consist of actions performed with the "eyes (*gaze*), faces

(*facial expressions*), hands and arms (*gestures*), and the movements and orientation of their bodies (*postures*)" (Whittaker et al, 1997:28). The visible information consists of shared objects and events, and the social presence of the other people within the same communications environment.

The first behavior, gaze, is how people pull out information from within their environment. *Gaze* can include the direction a member looks, the amount of time they spend looking, and can help the communicator determine that the receiver understands the message being sent. *Gaze* can facilitate communication turn taking and can also be an indicator of attitudes. There is evidence that users of collaborative systems with video are aware of, and make use of, information transmitted by *gaze* (Tang and Isaacs, 1995:151). *Facial expressions* are communicated with the eyes, nose, mouth, eyebrows and forehead and are important in determining the level of understanding of the communications receiver. According to Whittaker et al, the eyes, eyebrows, and mouth have communicated several specific facial expressions to include "happiness, sadness, surprise, anger, disgust, fear, and interest" all regardless of the culture of the receiver (1997:31). The behavior *gestures* entail the different movements of the hands and arms when communicating. Like the *gaze*, it can help coordinate content delivery and understanding of the communicator's message. In fact, some research suggests that gestures can accomplish two or three events at the same time (Heath, Luff, and Sellen, 1997:172). The fourth and final behavior, *posture*, communicates the interest level, acceptance, and understanding of the communicator's message. This information exchange happens even though *posture* is not as dynamic as the other behaviors and doesn't change that frequently during communication (Whittaker et al, 1997:32).

As stated earlier, visible information consists of shared objects and events, and the social presence of the other people within the same communications environment. Given a distributed GSS, the shared environment would consist of the actual GSS in addition to any of the common items found in the distributed rooms. This suggests that using video within a GSS environment may facilitate the communication process.

Research has also shown that, in comparisons between face-to-face, audio-only, and video-plus-audio modes of interaction, access to visual information has no significant effect on the outcome of creative or intellectual tasks. Whereas, tasks such as conflict, bargaining, and negotiations seem to be affected by the absence or presence of the visual communication channel (Sellen, 1995:404). This study posits that video makes an impact on conflict, bargaining, and negotiations because it moderates the procedural justice structure and the interpersonal behaviors, while providing a higher level of trust than would otherwise be required. This is supported by interviews with video-mediated collaborative teams where users suggest that they like having video because they can see reactions of other team members (Tang et al, 1995:140). Users also suggested they like to see if other members understand their attempts to communication. Finally, members of collaborative teams thought the use of video made the communication more personal.

2.6 Measuring Group Member Justice Perceptions in MFF

Since it is argued that the facilitator can have an impact on perceptions of trust and fairness and therefore influence the meeting outcome, it is important to understand under what conditions this occurs.

The study of fairness in organizations has been a focus of researchers throughout the years and has resulted in the identification of two types of justice—distributive and procedural. *Distributive justice* concerns outcomes whereas *procedural justice* refers to the "process by which outcomes are determined (Greenberg, 1993:79)." According to Cropanzano and Folger, (1991) outcomes and procedures work together to create a sense of injustice. A full understanding of fairness cannot be achieved without considering the interaction (1991:136). Kramer further invokes the construct of trust to better understand the interactive relationship between procedural and distributive justice. He states: "It is the degree of trust engendered by procedural fairness that interacts with distributive justice to influence reactions" (1993:398). Trust is affected by individual's estimates of procedural justice (Kramer, 1996:401).

Greenberg's Taxonomy of Justice Classes, in Figure 2.3 below, clarifies the distinction between structural and social factors and their place in the established categories of justice—procedural and distributive (1993:80).

	Category of Justice	
Focal Determinant	Procedural	Distributive
Structural	Systemic Justice	Configural Justice
Social	Informational Justice	Interpersonal Justice

Figure 2.3 Taxonomy of Justice Classes (Greenberg, 1993:83).

Combining categories of justice with focal determinants of justice creates four classes of justice: systemic, configural, informational, and interpersonal (Greenberg, 1993:83). These resultant classes are in the model above, and discussed in more detail on the next page.

Systemic justice refers to the procedural justice that is accomplished through structural means. Fairness demands that meeting procedures allow for allocation decisions to be made such that they disallow expressions of bias and are consistent over people and time. They must represent the concerns of all interested parties (Greenberg, 1993:84). In terms of MFF, perceptions of systemic justice may be influenced by a facilitator's ability to more easily communicate with meeting member – "creating an unfair advantage for some of the group's members at the expense of others" (Lea, 1998:19). The structural component of procedural justice is likely to influence perceived trust, and thus it makes sense to form expectations of future behavior on the basis of structure (Kramer, 1996:403).

Informational justice involves "providing knowledge about procedures that demonstrate regard for peoples' concerns" (Greenberg, 1993:84). People make trust judgments based on the behavior of the parties who implement the decision (Kramer, 1996:403). Such judgements are process-oriented perceptions of fairness influenced by social means (Greenberg, 1993:84). The perception of fairness with which the facilitator behaves will likely be attributed to the facilitator's disposition (Kramer, 1996:403). Greenberg suggests that the open sharing of information will promote this class of justice (Greenberg, 1993:84). In the context of MFF, the availability of feedback and support activities performed by the facilitator influence user perceptions of information justice.

Therefore, if a facilitator is aligned with a group member, other members may fear that they lack important information, which puts them at a disadvantage (Lea, 1998:19).

Configural justice refers to distributive justice that is accomplished through structural means. It describes the perceptions of fairness about outcomes that people learn through structural influences (Greenberg, 1993:85). In terms of the MFF, this includes the degree to which members understand the meeting structure to be free from bias (Lea, 1998:19).

Interpersonal justice, finally, refers to the social aspects of distributive justice. Interpersonal justice focuses on the consequences of outcomes. These perceptions are determined through social means (Greenberg, 1993:85). Greenberg said that "complaints of being let down by someone, or of selfish behavior, reflect a perception of failure to meet social obligations" and thus a violation of interpersonal justice (1993:86). The simple appearance that a facilitator favor's a single meeting member may be enough to cause frustration among others (Lea, 1998:19). The level of interpersonal justice interacts with a corresponding degree of trust to influence individual's reactions to the outcome (Kramer, 1996:404).

The four classes of justice above have an important relationship with the MFF model. The four collectively classify the types of perceptions that meeting participants may develop about the fairness of the GSS meeting structure and support. Greenberg's taxonomy with Kramer's discussion on the role of trust identifies four distinct perceptions of situational justice that may be influenced by facilitator co-location and alignment with a single meeting member. Procedures that are structurally and socially fair will engender trust in the system and in the implementers of the decision, whereas a

lack of structural or social fairness will elicit low levels of trust (Kramer, 1996:403). It is hypothesized that the direct effect of situational justice on the group process and process outcomes encountered by alignment and co-location may be mitigated by video intervention. The MFF model is related to Greenberg's justice classes in Figure 2.4, below.

	Category of Justice	
Focal Determinant	Procedure	Outcomes
Structure	Fairness of System Design (Systemic Justice)	Equity of User Control over Process (Configural Justice)
Support	Facilitator Neutrality (Informational Justice)	User Perception of Group Synergy (Interpersonal Justice)

Figure 2.4 MFF Justice Perceptions.

2.7 Relationship of Meeting Structure, Support, and Video Mediation to User Perceptions, Attitudes, Behavior, and Group Decision Quality

The relationship between system design/structure (facilitator location), support (facilitator alignment) and video intervention on group member perceptions, attitudes, behavior, and decision quality is depicted in the nomological model (Figure 2.5, next page). The model illustrates that facilitator location and alignment influence the

facilitator's ability and intent to communicate privately with a single meeting member over GSS in the distributed setting.

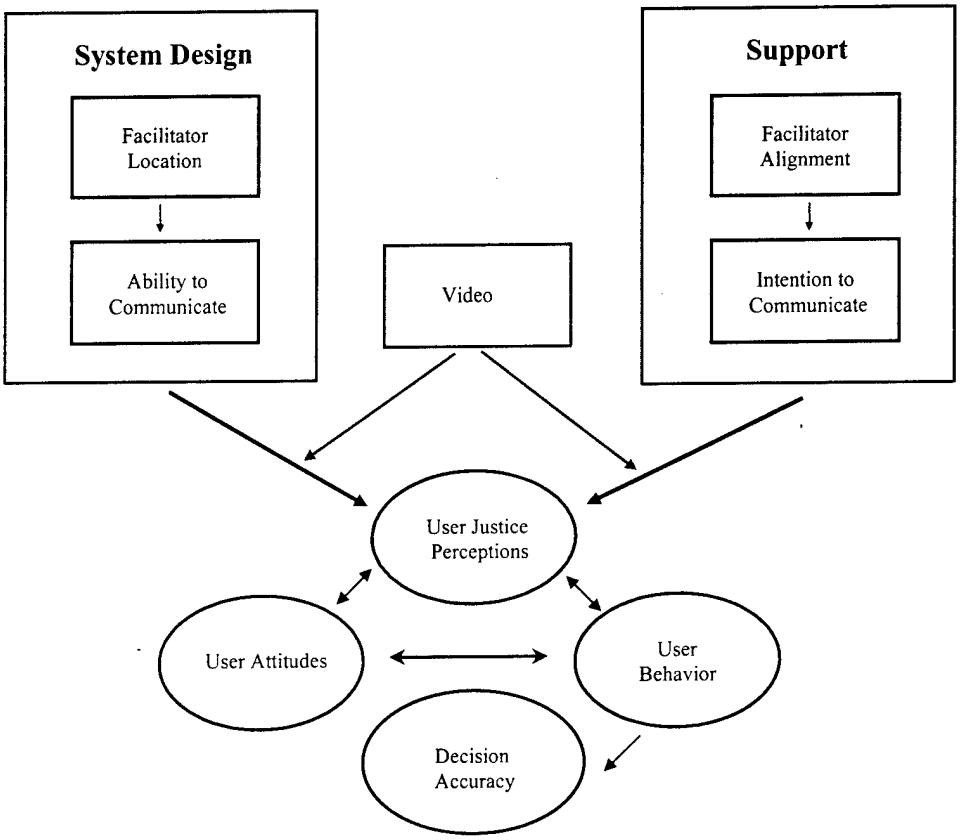


Figure 2.5 Nomological Model.

This study assumes users of a system individually form perceptions of the fairness of their situation based on cues present in their environment relative to system design and support. Individual justice perceptions greatly effect users' attitudes towards their situation and individual behavior in the meeting setting (Bostrom, et al., 1993:158). The model depicts user behavior, as determined by user attitudes and justice perceptions, as a direct determinant of decision accuracy. It is also the position of this study that video intervention will moderate any negative perception of justice which ultimately impacts decision accuracy.

2.8 Research Hypotheses

This study assumes that system designs consisting of facilitator alignment, co-location, and video will have an impact on procedural justice structure and interpersonal behavior as they relate to user justice perceptions, attitudes towards the efficacy of GSS, user behavior, and ultimately, group decision quality. Lea (1998) found that degrees of partiality could be influenced through the location and alignment of the facilitator. More specifically, co-location of the facilitator with a single group member will have a detrimental effect on the structural determinants of user justice perceptions. Similarly, Lea's study also found that alignment with a single group member would negatively impact the social determinants of user perceptions.

Our premise is that the ability to see the facilitator and other group members through the use of video will moderate both the structural and social determinants of user justice perceptions. Specifically, the presence of video will mitigate the negative effects of co-location and alignment through the added richness of the communications channel. This study ultimately suggests that the three variables will interact, such that users will perceive their situation consisting of facilitator co-location, and actual facilitator alignment with one meeting member as being the most unfair when video is absent. Thus, when video is present the negative perceptions will be mitigated when facilitator location and alignment are manipulated. These perceptions of situational justice should, in turn, influence group member attitudes, behavior, and ultimately, group decision quality.

2.8.1 Hypothesis 1: Interactive effects of Facilitator Co-location and Video Intervention

Video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on user justice perceptions, their attitudes towards the efficacy of GSS, information sharing behavior, and group decision quality.

Hypothesis 1a: Video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on *user justice perceptions*.

Hypothesis 1b: Video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on user perceptions of the *efficacy of GSS technology*.

Hypothesis 1c: Video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on *user information-sharing behavior*.

Hypothesis 1d: Video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on *group decision quality*.

2.8.2 Hypothesis 2: Effects of Facilitator Alignment (perceived or actual) and Video Intervention

Video intervention and facilitator alignment (perceived and actual) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (perceived and actual) has on user justice perceptions, their attitudes towards the efficacy of GSS, information sharing behavior, and group decision quality.

Hypothesis 2a: Video intervention and facilitator alignment (perceived and actual) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (perceived and actual) has on *user justice perceptions.*

Hypothesis 2b: Video intervention and facilitator alignment (perceived and actual) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (perceived and actual) has on user perceptions of the *efficacy of GSS technology.*

Hypothesis 2c: Video intervention and facilitator alignment (perceived and actual) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (perceived and actual) has on *user information-sharing behavior.*

Hypothesis 2d: Video intervention and facilitator alignment (perceived and actual) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (perceived and actual) has on *group decision quality.*

2.8.3 Hypothesis 3: Interactive Effects of Facilitator Co-Location, Alignment (perceived or actual), and Video Intervention

Video intervention, co-location and alignment (perceived and actual) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative effects co-location and alignment (perceived and actual) has on user justice perceptions, their attitudes towards the efficacy of GSS, information sharing behavior, and group decision quality.

Hypothesis 3a: Video intervention, co-location and alignment (perceived and actual) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact of co-location and alignment (perceived and actual) on *user justice.*

Hypothesis 3b: Video intervention, co-location and alignment (perceived and actual) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact of co-location and alignment (perceived and actual) on user perceptions of the *efficacy of GSS technology.*

Hypothesis 3c: Video intervention, co-location and alignment (perceived and actual) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact of co-location and alignment (perceived and actual) on *user information-sharing behavior.*

Hypothesis 3d: Video intervention, co-location and alignment (perceived and actual) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact of co-location and alignment (perceived and actual) on *group decision quality.*

2.9 Summary

The GSS has been offered up as the panacea for effectively improving group processes to improve decision quality. Many proponents of GSS enthusiastically advertise the ability of the technology to improve the generation and sharing of information (Nunamaker, 1997: 357). However the GSS in its current design may not be a "cure-all." The GSS structure and inherent interactions can produce problems that are not seen in face-to-face working groups. Users of the GSS often subordinate control to the system and the facilitator. This subordination requires trust in the structure of the system and in the social interactions mediated by the facilitator. Resulting levels of trust place constraints on the utility of the GSS and ultimately the effectiveness of the decision-making group.

The original research contained in this study tested the hypothesis that system designs, such as facilitator alignment and co-location, which foster negative user justice perceptions can have those perceptions moderated with the utilization of video.

III. Methodology

3.1 Introduction

As discussed in the first chapter, the purpose of this study is to determine the impact of facilitator alignment, co-location, and the employment of video in distributed meetings utilizing a Group Support System. Chapter two summarized the relevant research literature and expanded on the theoretical framework developed by Lea (1998) to explain the impact of system design upon perceptions of user justice, user attitudes, user behavior, and group decision quality with the employment of a GSS. This chapter describes how data were collected, quantified, and statistically analyzed to test the hypothesized relationship between the independent variables of alignment, co-location, and video-intervention with process outcomes.

3.2 Experimental Design

This study employed a fully randomized experiment to investigate the main and interactive effects of facilitator alignment and co-location, with and without video intervention on the perceptions, attitudes, and subsequent behavior of all members of a computer-mediated decision-making group. The 2 x 3 x 2 factorial design depicted in Fig 3.1 on the following page, manipulates the location of the facilitator (isolated from all participants or co-located with the confederate experiment administrator), the perceived alignment of the facilitator (neutral, perceived aligned with group member A, or actually aligned with group member A) and the intervention of video.

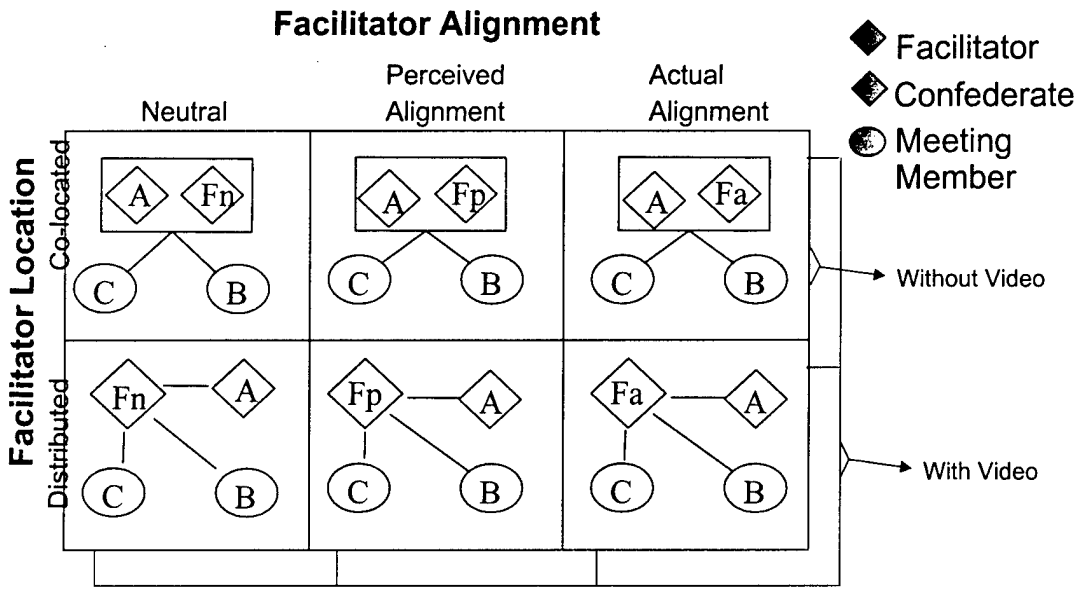


Figure 3.1 Alternative system configurations for treatment groups. The six conditions are replicated with and without use of video.

The experiment replicated the task from Lea's (1998) study. Subjects were asked to perform a hidden-profile, information-sharing task to successfully identify the first-, second-, and third-place finishers (also known as a *trifecta)*, from a field of nine horses running in a fictional race called the Cooper Stakes. Correct identification of the race winners did not involve chance or the ability of the subject. Instead, the correct decision depended on participants sharing unique information, such as race length, region, and temperature, describing the ten race conditions for the day of the fictional race, along with the nine horses' individual preferences relative to each race condition. The information was organized in a 108-bit matrix (9 horses x 12 conditional preferences = 108 information bits). Each participant received a partially filled matrix containing 35 unique and 2 shared pieces of the available information. The actual information that was

held by each participant is included in Appendix A. Participants were unaware of the exact amount of data that was unique or shared between group members.

Subjects were instructed to match a horse's preferences to the actual conditions of the race. If a horse's preference in a given category matched up to the respective condition on race day, the horse was awarded a point for that category. If a horse's preference did not match up to the respective race condition, the horse received a score of zero for the respective category. The first-, second-, and third-place finishers in the race, and thus the highest scores, received eight, seven, and six out of ten possible points, respectively (Lea, 1998:27-28).

As with Lea's (1998) study, the design increased saliency for the research subjects by instructing participants that a cash payment would be awarded based on the accuracy of their individual bets. The instructional materials explained that a betting scheme called *pari-mutuel* betting would be used, whereby odds were placed on the horse dependent upon the number of people who bet on that horse. For example, if all three participants correctly identified the top three finishers, then the payoff for the bettors would be lower than if only one or two of the bettors correctly identified the trifecta. Each participant was provided the specific information in the form of Table 3.1 on the following page.

Table 3.1

Pay-Off Information Provided To Individual Group Members.

Number of Correct Bettors	Total Earnings for Correct Bet	Total Earnings for Incorrect Bet
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Understandably, participants could either share all information to benefit the group as a whole or they could choose to act selfishly and thereby increase their own odds of a higher payoff. Further, participants would consider the likelihood of whether other group members will share information or act selfishly.

3.3 Equipment and Facilities

The experiments were conducted at a GSS laboratory located at the University of Dayton in a wing of the Psychology Department. CUSeeMe software, developed in 1993 by Cornell University, was operated over a network of four distributed clients connected to a Windows NT 4.0 server. The CU-SeeMe software was selected over University of Arizona's GroupSystems because of its ability to seamlessly integrate video into the groupware environment.

Each GSS location was set up with a telephone headset with a conference call capability between the workstations. Experiment subjects were instructed that the headphones would be used only to disseminate experiment instructions and to facilitate any questions the group may have of the facilitator, since the experimental task would be conducted solely across the GSS.

3.4 Experiment Manipulations

The manipulations to create the neutral and perceived alignment treatment conditions were identical to those used by Lea (1998). All subjects were provided introductory materials, which included both language and graphics describing the design of the experiment with particular attention brought to the relevant variables. To further ensure the sufficiency of the manipulation, subjects were tasked to complete a short quiz subsequent to reading the introductory materials and prior to the start of the actual experiment. Each participant's answers were reviewed for accuracy with detailed explanations given by the facilitator for any questions incorrectly answered. The handouts for treatments 1-6 are included in Appendices B – G.

3.4.1 Alignment Manipulation

All subjects generally accepted the facilitator's role as experiment administrator. As such, the neutral manipulation required no intervention on the part of the facilitator. Perceived alignment treatments required the formation of a plausible reason to which the facilitator might aid a single participant. To accomplish this, participants were informed via the instructional materials that in the course of a face-to-face meeting, a facilitator

could align with a meeting participant to effectively influence the meeting's outcome. The subjects in the perceived aligned condition were then told that the purpose of the experiment was to see how the group members react to an aligned facilitator. In addition, subjects were reminded with the following statement: "Today, the facilitator will attempt to provide special help to Participant A in order to maximize his or her performance." This statement impressed upon the experiment subjects the facilitator's penchant to help one participant maximize his or her performance. The facilitator's actions, as scripted in the perceived alignment treatments, were identical to those actions present in the neutral treatments. Under both the neutral and perceived aligned conditions, the facilitator offered no extra assistance to Participant A

The actual alignment condition is an addition to Lea's (1998) research. The actual alignment treatment expands the perceived alignment manipulation scenario with actual process aid during the experiment. For example, the manipulation included the facilitator-typed comment "Participant A, make sure you don't share more information than B and C are sharing."

Initial pilot testing of the twelve treatments, indicated the manipulation of actual alignment may not have been adequate. Post-experimental discussions with the participants as well as survey questions verifying the various manipulations suggested that participants did not recognize the motivation for *actual* alignment between the facilitator and the confederate. Therefore, actual alignment treatments were re-administered using new participants and additional comments. Statements such as "My boy/girlfriend is going to be Participant A today" or "Participant A is one of my instructors" were offered to subjects to establish a relationship between the facilitator and

participant A. These statements provided a credible reason why the facilitator may act to favor one participant over another. Subsequent manipulation checks ensured participants were now cognizant of *actual* facilitator alignment.

3.4.2 Facilitator Location Manipulation

Facilitator location was successfully manipulated by providing a pictorial depiction as well as verbally informing the subject. The graphic either portrayed complete facilitator isolation or co-location with one of the participants, a confederate experiment administrator. This technique replicates that used in Lea's (1998) study. In addition, those treatments with video cameras allowed participants to visually see the manipulation for themselves.

3.4.3 Video Manipulation

The 2X3 factorial design was completed once without video and then again with video. Video cameras included with the CUSeeMe software were mounted on top of the computer terminals and provided a visual, head-and-shoulder image of each participant. The images of the three group members and the facilitator appeared across the top of 17-inch monitors. Each picture, approximately 2 x 2 inches square, provided real-time video images of each participant's actions. In the co-located treatment conditions, Participant A also appeared in the background of the facilitator's video image.

At the conclusion of each experiment, a survey was given to measure the effectiveness of manipulation checks. The survey is included in Appendix H. The analyses of the survey results are described in Chapter 4.

3.5 Subjects

The 148 subjects required in this study were drawn from the undergraduate student body of the University of Dayton and the graduate student body of the Air Force Institute of Technology. Because of the addition of a confederate, only two subjects were required to conduct an experiment versus the three subjects used in Lea's study. This change to two students allowed more accurate measurement of the manipulations. In Lea's study, little variance was achieved from participant A (the subject receiving direct co-location or alignment) between the different treatments. Participant A never received any actual assistance from the facilitator in collocated or perceived aligned conditions. The perceptions of the possibility of receiving favorable treatment were suppressed by the experience of not receiving assistance. Thus, participant A would see no problems with system design when co-located with the facilitator even though participants B and C did. Further, by having the need for only two subjects, scheduling and experiment control were easier to facilitate.

3.6 Task and Procedures

Two experimental subjects interacted with two experiment administrators over a distributed GSS running CUSeeMe software. One experiment administrator was a confederate acting as a group participant (Participant A), while the other as the group facilitator. Both the confederate and the meeting facilitator worked from two scripts (neutral and aligned) and standard rules of engagement (See Appendices I, J, and K, respectively). The experimental subjects were unaware of participant A's confederacy as

confirmed in post-experimental interviews. Three subjects were scheduled for each treatment although only two were required. This ensured a backup participant was readily available in the event one of the subjects failed to arrive on time. The subjects were seated according to the order in which they arrived for the experiment; participant C followed by participant B respectively. The third and last arrival was paid $5 dollars and instructed that all three available experiment positions have already been filled. Overbooked participants were offered opportunities to either reschedule or decline to participate in the experiment altogether.

Each of the three rooms were equipped with a GSS workstation, video cameras, headphone intercom system, instructional materials, consent form, and two manila envelopes complete with a participant-specific race matrix, betting form (Appendix L) and survey. Due to the use of video and the potential to visually monitor the other rooms before the start of the session, screensavers were activated on all workstations and a password was required to access the system. Participants were immediately informed upon entering their stations that they were on camera and the facilitator was monitoring their activities. In those treatments where video was not used, the cameras were removed.

Participants were then instructed to read and sign a consent form stating their rights as an experiment participant. The subjects were then told to don their headphones where the facilitator, working from a script, instructed the participants to carefully read the instructional materials and complete the exercise section at the back of the handout. After allowing sufficient time to complete the exercise portion of the introductory

materials, the facilitator visited each participant to check the answers to the exercise and clear up any confusion on incorrectly answered questions.

The facilitator used the audio system to confirm there were no further questions from the group, and provide the screensaver password to all experiment subjects. This allowed the participants to view the active GSS for the first time. The facilitator then instructed the participants to remove their headsets. From this point all communication between the facilitator and the participants took place through the GSS.

Subjects were given further guidance about GSS use and then instructed to enter the phrase, "I'm here." Participant identifiers (Facilitator, A, B, or C) were attached to all comments entered into the GSS. Additionally, those treatments utilizing video also attached participant identifiers to the respective video streams. It should also be noted that the students were asked on three occasions throughout the introduction if there were any questions. This ensured that everyone understood the information-sharing task, which involved identifying the first-, second-, and third-place finishers, in order, from a field of nine horses running in a fictional race.

Subjects were given two minutes to review their race form, which was enclosed in a manila envelope at their workstation. After such time, the participants were given forty minutes to complete the task at hand. During the experiment, participant A, the confederate, was charged to share all bits of information that he or she had available. The speed and quantity of data transmission were determined by the actions of participants B and C. The confederate had the combined task of appearing natural to the group as a first-time novice to the task, as well as to provide consistency across all conditions. As such, it was determined to let the group pace the confederate. The confederate would

share a bit of information and then wait until each other member shares one bit of information before sharing additional bits. The confederate was also placed on a schedule to share all of his or her information by the end of the session.

During the course of the experiment, the facilitator was tasked to guide efforts and provide inputs on time remaining for the group. The facilitator and confederate accomplished these goals by providing comments driven by time and also as a percentage of data passed. This ensured a group that took 20 minutes to solve the task received the same scripted comments that a group taking 40 minutes received. The underlying goal was to ensure maximum control over the experiment process and ensure the actions of the facilitator and confederate were the same for each experiment, except for alignment, co-location, and video manipulations. Special care was taken to ensure that during the treatments with video, the facilitator and participant A did not look at each other or speak to each other. It was important that procedural fairness and trust be based solely upon the manipulations of facilitator alignment and location.

Experiment end was signaled either by the group's consensus on completion of the task or the expiration of the allotted 40 minutes. At the end of the session, the facilitator instructed the group to close their conference session. The facilitator then proceeded to each participant's room where he or she opened a text transcript of the comments submitted during the conference session for the subject's review. The facilitator told participants individually that they had ten minutes to review the information before making their final decision. After ten minutes, participants were visited once again by the facilitator and instructed to complete the betting form and survey enclosed in a manila envelope.

After the completion of all experiment tasks, the facilitator debriefed the subjects in accordance with the script attached at Appendix M. Consistent with procedures followed by Lea (1998), results of the experiment were not revealed to participants. Instead, all participants were paid ten dollars upon completion regardless of performance. When debriefing was completed, the facilitator immediately printed a transcript of the group's conversation and collected the experiment materials from the participant's workstations and placed all materials in a manila folder that was labeled by session number and treatment.

3.7 Hypothesis Outcome Measures

As stated previously, this study is based upon the supposition that manipulation of facilitator location and alignment to include the intervention of video in a distributed GSS environment will effect user justice perception, user attitudes, user behavior, and group decision quality. The constructs as adapted from Lea (1998) are defined in Table 3.1, next page.

According to Zikmund (1984), "attitudes, motivations, expectations, intentions, and preferences cannot be observed" (222), therefore, a post-experimental survey was administered to measure user justice perceptions and user attitudes. The structural and socially determined perceptions of procedural and distributed justice for each condition consisted of four scales developed and validated by Lea (1998:38).

Table 3.2

Construct Definitions (Adapted from Lea, 1998)

Construct 1. User Justice Perceptions
Definition: Users' impressions of facilitator neutrality (informational justice), the equity of user control over the group process (configural justice), group synergy (interpersonal justice), and the fairness of GSS design (systemic justice).
Construct 2. User Attitudes
Definition: Users' dispositions towards the performance of the meeting facilitator, utility, usefulness, and perceived ease of use of the GSS, and dynamics of the participant group.
Construct 3. User Behavior: Speed of Data Transfer
Definition: Amount of time left after transfer of all data bits.
Construct 4. Group Decision Quality
Definition: Average value of individual decisions reached by participants in a group, measured relative to an optimal decision set.

The second construct, user attitudes, employed three scales developed by Lea (1998:38-39) and an additional fourth scale as developed and validated by Fred Davis and others in his Technology Acceptance Model (1989:991). The first three scales measured participants' satisfaction with the meeting facilitator, satisfaction of group dynamics, and perceived utility of the GSS, while Davis' scale measured participants' perceptions of ease of use of the GSS.

User behavior, the third construct, measured the available time left from the 40-minute task when the last piece of data was given. Time differences show users' propensity to share based upon their trust of the system.

Group decision quality was quantitatively analyzed by manual coding of the betting forms. As taken from Lea's research, numerical values were assigned by taking a horse's placement score and multiplying it by 0.5, 0.333, and 0.167 dependent upon their finish. "The formula yielded a weighted value of 7.33 for the optimal decision set ([8 points * 0.5] + [7 points * 0.333] + [6 points * 0.167] = 7.33) (1998:34)." Individual scores for participants B and C were totaled and then combined to form an average score for the group. This number is compared to the optimal decision set value for relative quality of the decision.

3.8 Survey Design and Validation

The user justice perceptions and user attitudes constructs were broken down into eight measured variables described in Table 3.2, below. With the exception of ease of use, each variable was measured with four items using a seven-point Likert scale. Users' perception of ease of use was measured with six items and also employed a Likert scale. The final survey included forty-two randomized items ([7 measured variables + 2 manipulation checks] * 4 questions each + 6 ease of use questions = 42 questions total).

Table 3.3

Definition of Measured Variables – Construct 1 (Adapted from Lea, 1998)

Construct 1. User Justice Perceptions

Measured Variable 1a. User Perceptions of Facilitator Neutrality (Informational Justice)

Definition: Users' impressions of facilitator biases and the impact of these biases on facilitator conduct, behavior, and direction of the group process.

Measured Variable 1b. User Perceptions of Equity of Control over Group Process (Configural Justice)

Definition: Users' impressions of whether the power to influence the meeting process, outcome, or other group members was distributed equally among experiment participants.

Measured Variable 1c. User Perceptions of Group Synergy (Interpersonal Justice)

Definition: Users' impressions of whether group members shared information cooperatively.

Measured Variable 1d. User Perceptions of the Fairness of GSS Design (Systemic Justice)

Definition: Degree to which the user was contented with the interactions and behavior of subject group members.

Collected survey data was initially analyzed to ensure inter-item reliability. Data was first coded to a spreadsheet, sorted by item key, and then assessed using SPSS 9.0 statistical software. The result was a correlation matrix, reliability coefficient, mean, and standard deviation for each set of questions by measured variable. Scale reliability was estimated by calculating the internal consistency of each multi-item scale as indexed by

Table 3.4

Definition of Measured Variables – Construct 2 (Adapted from Lea, 1998)

Construct 2. User Attitudes

Measured Variable 2a. User Satisfaction with Facilitator

Definition: Degree to which the user is contented with the performance of the meeting facilitator.

Measured Variable 2b. User Belief in GSS Utility

Definition: Degree to which the user feels the GSS was a useful aid to the group and the group meeting process.

Measured Variable 2c. User Satisfaction with the Dynamics of the Participant Group.

Definition: Degree to which the user was contented with the interactions of group members.

Measured Variable 2e. User Perception of Ease of Use

Definition: Degree to which the user believes that using the Group Support System will be free from effort (Davis, 1989).

Cronbach's coefficient alpha (α) (Nunnally & Bernstein, 1994:212). Reliability analysis, as described in Tables 3.4 – 3.6, next page, reveal an acceptable reliability of at least .78, which is consistent with recommended standards (Nunnally and Bernstein, 1994:265). The mean for each measured variable was calculated by dividing the grand mean by the number of items included in each measure.

Table 3.5

Reliability Analysis – Manipulation Checks

	M	SD	α
Manipulation Check 1: Facilitator Location	**3.7653**	**1.5456**	**.8317**
One of the experiment participants had better access to the facilitator than the other participants.	4.0748	2.0105	
One of the experiment participants had the ability to communicate with the facilitator without the knowledge of the other participants.	3.7686	1.8947	
One of the experiment participants had the ability to communicate with the experiment facilitator outside of the GSS.	3.6599	1.7808	
The facilitator had the ability to communicate with one experiment participant without the knowledge of the other participants.	3.5578	1.8913	
Manipulation Check 2: Facilitator Alignment	**4.6149**	**0.9284**	**0.9284**
The facilitator had incentive to provide special aid to one experiment participant.	4.8378	2.0867	
The facilitator had motivation to influence the experiment's outcome in favor of one experiment participant.	4.5135	2.3575	
The facilitator had reason to provide special help to just one experiment participant.	4.4459	2.1453	
The facilitator was motivated to enhance the performance of one participant at the expense of the other participants.	4.6622	2.1714	

Table 3.6

Reliability Analysis - User Justice Perceptions

	M	SD	α
MV1a: User Perceptions of Facilitator Neutrality	**4.6571**	**1.4449**	**0.8067**
The facilitator did not provide special aid to any participant during the experiment.	4.4189	1.9761	
The facilitator helped all participants equally during the experiment.	4.6081	1.8132	
I trusted that the facilitator was helping all participants fairly during the experiment.	5.0676	1.6605	
The facilitator acted impartially throughout the experiment.	4.5338	1.8010	
MV1b: User Perceptions of Equality of Power Distribution Among Experiment Participants	**5.5845**	**1.1228**	**0.8404**
No experiment participant had more control over the meeting process than any other.	5.0473	1.6302	
All experiment participants shared equal power to control meeting outcomes.	5.7635	1.2528	
I had the same level of control over meeting outcomes as every other experiment Participant.	5.8108	1.1915	
All experiment participants shared equal power to control the information exchange process.	5.7162	1.3454	
MV1c: User Perceptions of Group Synergy	**6.3690**	**0.8278**	**0.9547**
All experiment participants willingly shared their information with the group.	6.3878	0.8948	
All experiment participants shared information cooperatively to benefit the group as a whole.	6.3605	0.8104	
All experiment participants actively shared information with the group.	6.3946	0.9549	
Every experiment participant shared information freely with the group.	6.3333	0.8627	
MV1d. User Perceptions of the Fairness of GSS Design	**5.3401**	**1.3529**	**0.8476**
The GSS employed in the experiment was set up to benefit all participants equally.	5.7483	1.4611	
The setup of the GSS benefited all experiment participants equally.	5.4354	1.6555	
The setup of the GSS favored all participants equally.	5.2041	1.7278	
The setup of the GSS ensured no meeting member could unduly influence the meeting process	4.9728	1.6756	

Table 3.7

Reliability Analysis - User Attitudes

	M	SD	α
MV2a: User Satisfaction with Facilitator	**5.9223**	**0.9771**	**0.8678**
I am satisfied with the aid the facilitator provided ME during the experiment.	5.5541	1.2793	
I feel the facilitator performed his duties in a satisfactory manner.	6.0541	1.0677	
I am satisfied with the facilitator's direction of the group's activities during the experiment.	6.1149	1.0069	
In my opinion, the facilitator performed his duties effectively.	5.9662	1.2422	
MV2b: User Belief in GSS Utility	**5.9899**	**0.7631**	**0.7804**
I feel the GSS employed in the experiment aided the information exchange process.	6.0068	0.9512	
I feel the GSS employed in the experiment was an aid to group efficiency.	5.8176	1.0944	
I feel the GSS employed in the experiment helped the group exchange information.	6.1419	0.8651	
I feel the GSS employed in the experiment helped focus the information exchange process.	5.9932	1.0068	
MV2c: User Satisfaction with Dynamics of the Participant Group	**6.2787**	**0.7020**	**0.8402**
I would not mind working with this group again.	6.1014	0.9457	
I am pleased with the performance of our group.	6.3243	0.9051	
In my opinion, I and the other experiment participants worked effectively as a group.	6.3311	0.8443	
I found the other experiment participants easy to work with.	6.3581	0.7000	
MV2d: User Perception of Ease of Use	**6.2342**	**0.5583**	**0.8173**
Learning to operate the GSS was easy for me.	6.4189	0.7192	
I found it easy to get the GSS to do what I wanted it to do.	6.2162	0.9505	
My interaction with the GSS was clear and understandable.	6.2095	0.7308	
I found the GSS to be flexible to interact with.	5.9459	0.9168	
It was easy for me to become skillful at using the GSS.	6.2230	0.6682	
I found the GSS easy to use.	6.3919	0.5789	

3.9 Statistical Analysis

All twelve of the hypotheses identified in Chapter II tested the basic premise that more fair arrangements of social interactions and structure would produce more favorable perceptions and attitudes, and more productive behaviors. Each of these hypotheses required a directional test that perceptions, attitudes and behaviors would be more favorable for participants in just conditions (e.g., just > unjust). In all cases, the null hypothesis was that participants in just conditions would have no better, or possibly less favorable perceptions, attitudes and behaviors (e.g., just < or = unjust).

The statistical technique used to analyze the relationship between two or more independent factors and a measured dependent variable is called a factorial analysis of variance (ANOVA). The SPSS 9.0 univariate ANOVA procedure was used to determine whether there were statistically reliable differences among the means due to the alignment, location, or video interventions. The ANOVA procedure compared the variance within a sample that can be explained by the treatment conditions to the total variance across all treatment groups.

The test of the null hypothesis for the main and interactive effects of facilitator alignment, location and video intervention on each measured variable were assessed through the accomplishment of a series of F-tests. The F-statistic is the ratio of the variability between treatment groups to the sampling error (McClave, Benson, and Sincich, 1998:830). The threshold to accept the statistic to be statistically reliable was set at $\alpha < 0.05$. Thus, the probability of a Type I error (falsely rejecting a null hypothesis) was less than five percent. If the calculated F-statistic is greater than the critical value of F associated with $\alpha < 0.05$, then the variation is attributed to the difference between the

treatments, and the null hypothesis was rejected in favor of the alternative hypothesis (Keppel & Zeddeck, 1989:80).

Interaction tables and summary statistics were generated using ANOVA for each construct containing measured variables. The ANOVA table provided an F-statistic for each main effect (align, location, and video) as all two- and three-way interactions. The data was analyzed separately for groups with and without the presence of video when the output indicated a statistically reliable two- or three-way video interaction. The means for each measured variable were plotted according to facilitator location and alignment. Where applicable, separate plots were made for the with- and without-video conditions.

Differences among the three aligned treatments were analyzed using Helmert planned comparisons. The Helmert technique preserves power, while controlling for the overall experiment-wise error rate specified at $\alpha = .05$ (Stevens, 1992:207). Using the Helmert comparison provided a direct test of the hypothesized effects of the neutral and aligned conditions. The Helmert procedure compared the mean of the neutral treatment condition to the average of the means for the aligned conditions, and then compared the perceived and actual alignment conditions to each other.

The index *eta-squared* (eta^2) was employed to assess the strength of the relationship. Eta^2 represents the proportion of variability in the dependent variable of interest that is explained by the independent variable. The value eta^2 can take on range from 0 to 1.00. The relationship between variables grows stronger as eta^2 approaches 1.00, and becomes weaker as eta^2 approaches 0. Standards differ considerably between researchers on the substantive interpretation of the index. Nonetheless, an eta^2 near 0.05 is generally considered a weak effect, 0.10 a moderate effect, and an eta^2 greater than

0.15 a strong effect. These measures, however, must be considered somewhat arbitrary and can be revised downward (Jaccard and Becker, 1997:275-276).

The use of eta^2 can also be additionally informative in cases where the F-test is found to be non-significant. Since statistical power increases with sample size, power will tend to be low when sample sizes are small. This is especially a concern when analyzing interaction effects. Low statistical power makes it relatively unlikely to reject a false null hypothesis. The statistical decision to not reject the null hypothesis is reinforced when eta^2 is small indicating a relatively trivial effect. In contrast, situations where the F-statistic is not significant and eta^2 is relatively large serve as flags alerting the researcher of potentially low statistical power (Jaccard and Becker, 1997:275-276). Without this awareness, the researcher may have a tendency to commit a Type II error, that is concluding the null hypothesis is true, when it is false (McClave, Benson, and Sincich, 1998:821).

3.10 Summary

The purpose of this chapter was to describe the course of action by which a 2x3x2 factorial experiment was administered to investigate the impact of facilitator alignment, facilitator location and video intervention on the efficacy of distributed GSSs. The chapter also explained and defined the constructs of user justice perceptions, user attitudes, user behavior, and group decision quality. Chapter three further explained each of these constructs as a set of as measured variables, and described the specific process by which data were gathered to quantify each variable. Lastly, the chapter presents the statistical means by which the gathered data were analyzed to make conjecture as to the

nature of the relationship between the independent variables of concern and process outcomes.

Results from this analysis are presented in Chapter IV, followed by an explanation of the results and recommendations for future research based on these findings in Chapter V.

IV. Analysis of Data

4.1 Introduction

This chapter provides a statistical analysis of the data. Summary results of all ANOVAs are provided in Appendix N. The findings will be discussed in greater detail in Chapter V.

4.2 Manipulation Checks

In order to determine manipulation effectiveness, the means from groups who received the manipulation were compared to those groups that did not receive the manipulation. An ANOVA test was conducted to assess the difference between means of the two groups.

4.2.1 Facilitator Location

Summary results for the manipulation of facilitator location are provided in Table 4.1 and Figure 4.1, next page.

According to a review of summary statistics, the manipulation of facilitator location was quite successful. Recipients of the co-location manipulation registered a mean of 6.142 (s = 0.879), as compared to a mean of 3.088 (s = 1.571) for those who were not exposed to the manipulation. This difference in means was statistically reliable at $p < 0.001$, ($F(1, 148) = 215.681$), with a strong effect as indexed by $eta^2 = 0.603$.

Table 4.1

Means and Standard Deviations for Manipulation of Facilitator Location

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	2.558	1.393	3.385	1.555	3.365	1.678
Co-Located	6.154	0.863	6.250	0.495	6.021	1.170

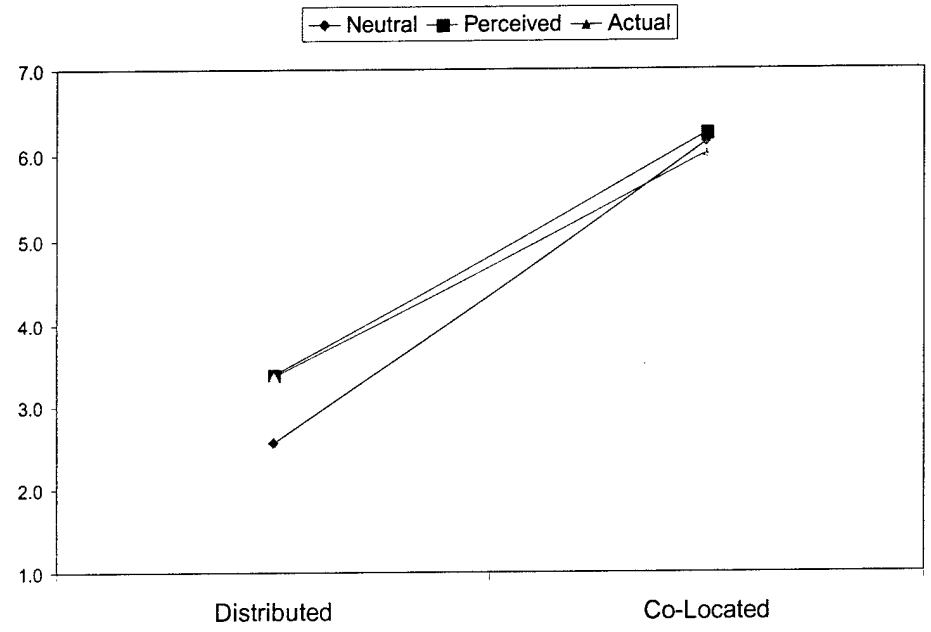


Figure 4.1 Plot of treatment means for manipulation of facilitator location.

4.2.2 Facilitator Alignment

Summary results for the manipulation of facilitator alignment are provided in Table 4.2 and Figure 4.2, below.

Table 4.2

Means and Standard Deviations for Manipulation of Facilitator Alignment

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	2.404	1.360	4.115	1.298	4.042	1.628
Co-Located	3.140	1.244	4.521	1.435	4.510	1.114

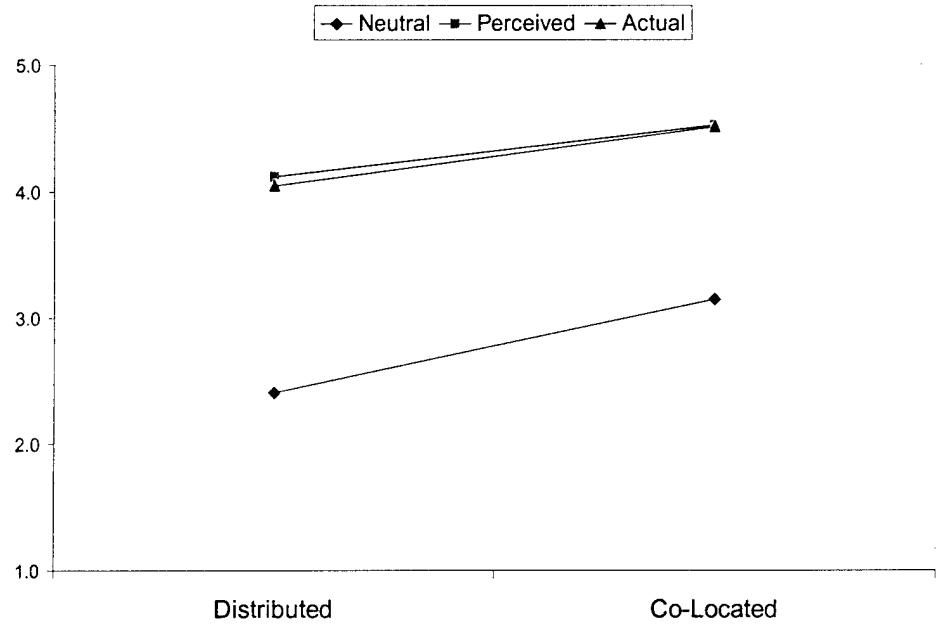


Figure 4.2 Plot of treatment means for manipulation of facilitator alignment.

Results from the ANOVA for manipulation of facilitator alignment indicate this manipulation was also successful. Participants exposed to the actual alignment manipulation registered a mean of 4.276 (s = 1.400), those exposed to the perceived

alignment manipulation, recorded a mean of 4.318 (s = 1.369), and non- recipients of the manipulation, registered a mean of 2.765 (s = 1.344). Review of summary statistics also indicated there was a statistically reliable main effect for location ($F(2, 148) = 21.087$, $p < 0.001$, $eta^2 = 0.23$), indicating that participants in co-located conditions were sensitive to the increased potential for alignment between the facilitator and Participant A. Planned comparisons using a Helmert contrast to control for experiment-wise error also confirmed a statistically reliable difference between the mean of the neutral condition and the combined or average means of the perceived and actual alignment conditions ($p < 0.001$) and no difference between the perceived and actual alignment conditions.

4.3 Group Member Perceptions of Fairness

4.3.1 User Perceptions of Facilitator Neutrality

Summary results for user perceptions of facilitator neutrality are provided in Table 4.3 and Figure 4.3, next page.

A review of the ANOVA showed main effects for facilitator alignment and facilitator location. Results indicated alignment of the facilitator with a single meeting member had strong negative effects on user perceptions of facilitator neutrality. Actual and perceived facilitator alignment registered means of 4.073 (s = 1.313) and 4.208 (s = 1.392), respectively, as compared to a mean of 5.611 (s = 1.099) for groups where the facilitator was not aligned. Summary statistics confirmed this statistical significance, $F(2, 148) = 22.958$, $p < 0.001$, $eta^2 = 0.24$. Planned comparisons using a Helmert contrast to control for experiment-wise error also confirmed a statistically reliable difference between the neutral condition and the combined means of the perceived and

actual alignment conditions ($p < 0.001$). No statistically reliable difference was found between the perceived and actual alignment conditions.

A slight negative effect on user perceptions of facilitator neutrality was also evidenced for facilitator co-location ($m = 4.476$, $s = 1.420$) as compared to groups in which the facilitator was distributed from all meeting members ($m = 4.838$, $s = 1.456$). Summary results confirmed this effect was statistically reliable ($F(1, 148) = 3.209$, $p = 0.038$, $eta^2 = 0.02$).

Table 4.3

Means and Standard Deviations for User Perceptions of Facilitator Neutrality

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	5.827	1.065	4.229	1.292	4.375	1.454
Co-Located	5.394	1.109	4.188	1.513	3.771	1.103

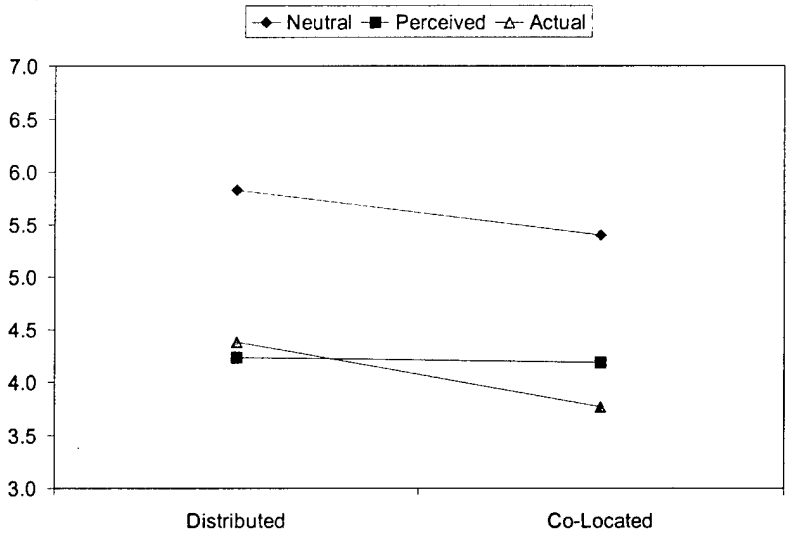


Figure 4.3 Plot of treatment means for user perceptions of facilitator neutrality.

A statistically reliable interaction effect was not evidenced for facilitator alignment and location, $F(2, 148) = 0.706$, $p = 0.248$, $eta^2 = 0.01$. There was also no interaction of facilitator alignment, facilitator location and video intervention, $F(2, 148) = 1.117$, $p = 0.165$, $eta^2 = 0.02$. Therefore, groups in which the facilitator was co-located and aligned with a single meeting member did not perceive the facilitator to be less neutral than in other treatment groups, and video mediation did not change user perceptions of facilitator neutrality.

4.3.2 User Perceptions of Equality of Power Distribution Among Experiment Participants

The ANOVA identified a statistically reliable interaction between facilitator location and video, with a corresponding summary statistic of $F(1, 148) = 5.213$, $p = 0.012$, $eta^2 = 0.04$. Due to the interaction of the video effect, this variable required further analysis between video and non-video treatments. Summary results for user perceptions of equality of power distribution among experiment participants without and with video were separated and are provided in Tables 4.4 - 4.5, next page. The interaction plots for both with and without video appear on Figure 4.4 on the following page.

Table 4.4

Means and Standard Deviations for User Perceptions of Equality of Power Distribution among Experiment Participants Without Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.196	0.786	5.708	0.673	5.750	1.153
Co-Located	5.625	1.454	5.083	1.294	4.650	1.197

Table 4.5

Means and Standard Deviations for User Perceptions of Equality of Power Distribution among Experiment Participants With Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.063	1.077	5.521	0.895	5.188	1.230
Co-Located	5.500	1.386	5.750	0.691	5.696	0.942

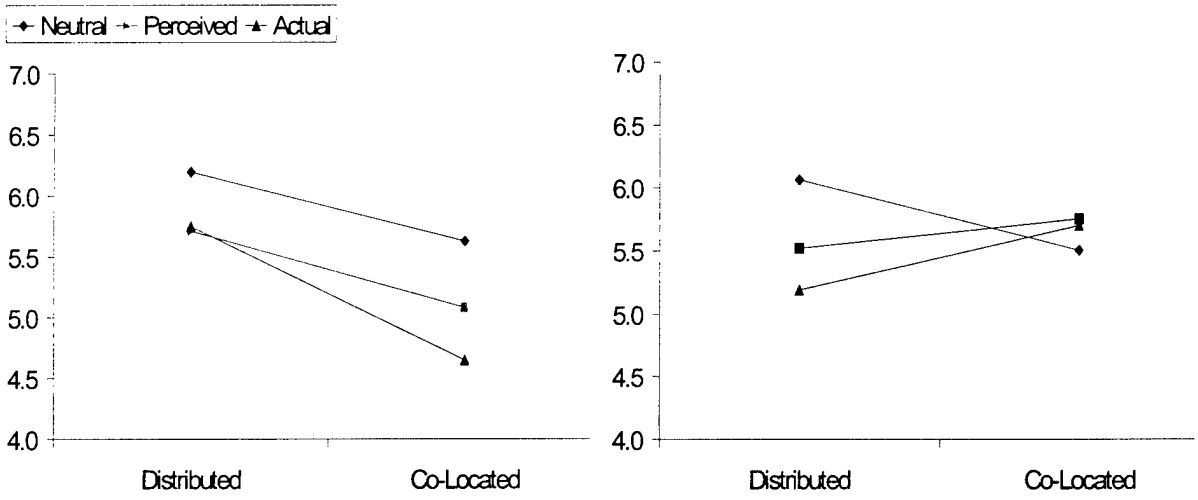


Figure 4.4 Plot of treatment means for user perceptions of equality of power distribution among experiment participants without and with video.

Results from the ANOVA of treatment groups without video indicated that alignment of the facilitator with a single meeting member has a negative effect on user perceptions of equality of power distribution among experiment participants, ($F(2, 74) = 2.701$, $p = 0.037$, $eta^2 = 0.07$). Actual and perceived facilitator alignment groups recorded means of 5.250 ($s = 1.275$), and 5.396, ($s = 1.058$), respectively. This was compared to a mean of 5.911 ($s = 1.183$) for groups in which the facilitator was not aligned. Planned comparisons using a Helmert contrast to control for experiment-wise error also confirmed a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions ($p = 0.013$). No statistically reliable difference was found between the perceived and actual alignment conditions. Co-location of the facilitator with a single meeting member also registered a negative effect on user perceptions of equality of power distribution among experiment participants, $F(1, 74) = 8.420$, $p = 0.003$, $eta^2 = 0.11$. Treatment groups that did not employ video but had a facilitator co-located with a single meeting member recorded less equal perceptions of power distribution between group members than those groups in which the facilitator was distributed from all members ($m = 5.1194$, $s = .190$ vs. $m = 5.8849$, $s = 0.183$).

Results from the ANOVA for treatment groups with video showed that the variables of facilitator alignment ($F(2, 74) = 0.646$, $p = 0.264$, $eta^2 = .019$) and co-location ($F(1,74) = 0.056$, $p = 0.407$, $eta^2 = .001$) have no statistically reliable effect on user perceptions of equality of power distribution among experiment participants. In addition, there was also no interaction between facilitator alignment and location ($F(2, 74) = 1.696$, $p = 0.095$, $eta^2 = .05$).

Contrasting the pattern of results from each group provides evidence that when the facilitator was either aligned with a single meeting member or co-located with a single meeting member, video reduced the less than equal perceptions of power distribution between group members. Groups in which the facilitator was co-located and aligned with a single group member did not perceive the distribution of power between experiment participants to be more unequal than the members of other treatment groups did.

4.3.3 User Perceptions of Group Synergy

A review of the ANOVA results showed a three-way interaction effect between facilitator alignment, location, and video ($F(2, 148) = 4.621$, $p = 0.005$, $eta^2 = 0.06$). Due to the interaction of the video variable, further analysis was required. Summary results for user perceptions of group synergy without and with video were separated and are provided in Tables 4.6 – 4.7, below and next page. The interaction plots for both without and with video appear on Figure 4.5, on the following page.

Table 4.6

Means and Standard Deviations for User Perceptions of Group Synergy without Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.321	1.085	6.750	0.384	6.333	0.786
Co-Located	6.625	0.457	6.646	0.458	5.775	0.878

Table 4.7

Means and Standard Deviations for User Perceptions of Group Synergy with Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.521	0.445	5.604	1.222	6.458	0.498
Co-Located	6.046	1.487	6.479	0.458	6.661	0.348

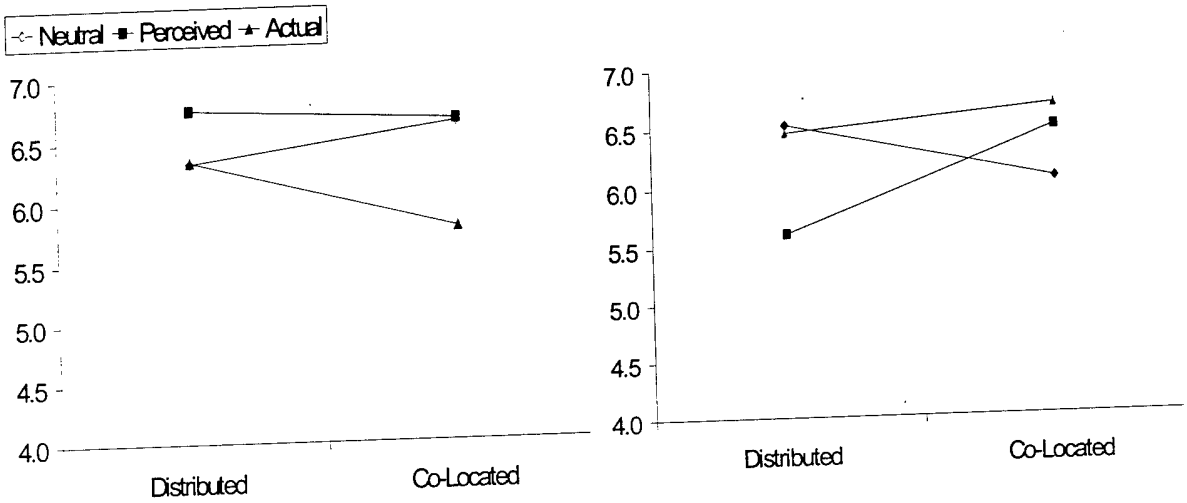


Figure 4.5 Plot of treatment means for user perceptions of group synergy without and with video.

Results from the ANOVA of treatment groups without video indicated that the alignment of the facilitator with a single meeting member had a negative effect on user perceptions of group synergy. Actual and perceived facilitator alignment recorded means of 6.080 (s = 0.857) and 6.698 (s = 0.417), respectively, whereas groups where the facilitator was not aligned recorded a mean of 6.473 (s = 0.832). Although, summary statistics showed this effect was statistically reliable, $F(2, 74) = 4.624$, $p = 0.006$, $eta^2 = 0.12$, planned comparisons using a Helmert contrast to control for experiment-wise

error did not show a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions ($p = 0.289$). However, a non-hypothesized difference was found between the perceived and actual alignment conditions ($p = 0.002$).

Co-location of the facilitator ($m = 6.396$, $s = 0.703$) had no effect ($F(1, 74) = 0.498$, $p = 0.241$, $eta^2 = 0.007$) on user perceptions of group synergy as compared to groups where the facilitator was distributed from all meeting members ($m = 6.461$, $s = 0.825$). In addition, a statistically reliable interaction effect was not evidenced for facilitator alignment and location, $F(2, 74) = 2.174$, $p = 0.061$, $eta^2 = 0.06$.

Results from the ANOVA for treatment groups with video indicate an interaction between facilitator alignment and facilitator location ($F(1, 73) = 3.787$, $p = 0.014$, $eta^2 = .10$), therefore further analysis was required to compare co-located and distributed treatment groups where video was employed.

Treatment groups with video where the facilitator was distributed from all members showed a negative effect for facilitator alignment $F(2, 36) = 4.867$, $p = 0.007$, $eta^2 = .23$. Actual and perceived facilitator alignment groups recorded means of 6.458 ($s = 0.498$) and 5.604 ($s = 1.222$), respectively, whereas groups where the facilitator was not aligned recorded a mean of 6.521 ($s = 0.445$). Planned comparisons using a Helmert contrast to control for experiment-wise error also showed a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions ($p = 0.047$). A statistically reliable difference was also found between the perceived and actual alignment conditions, however this was not hypothesized ($p = 0.007$).

Results from the ANOVA with video treatment groups where the facilitator was co-located with a single meeting member showed no facilitator alignment effect $F(2, 36) = 1.568, p = 0.111, eta^2 = .08$. Actual and perceived facilitator alignment groups recorded means of 6.661 ($s = 0.348$) and 6.479 ($s = 0.458$), respectively, whereas groups where the facilitator was not aligned recorded a marginal mean of 6.0455 ($s = 1.4867$).

Groups in which the facilitator was co-located and aligned with a single meeting member did not perceive lower levels of group synergy than other treatment groups.

4.3.4 User Perceptions of Fairness of GSS Design

A review of the ANOVA showed a three-way interaction effect between facilitator alignment, co-location, and video ($F(2, 148) = 3.469, p = 0.017, eta^2 = 0.05$). Due to the interaction of the video variable, further analysis was required. Summary results for user perceptions of fairness of GSS design without and video were separated and are provided in Tables 4.8 – 4.9, below and next page. The interaction plots for both without and with video appear on Figure 4.6, next page.

Table 4.8

Means and Standard Deviations for Fairness of GSS Design without Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.250	0.612	5.250	1.211	5.958	1.219
Co-Located	5.000	1.541	4.583	1.346	3.500	1.424

Table 4.9

Means and Standard Deviations for Fairness of GSS Design with Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.477	0.425	5.500	0.853	5.250	1.466
Co-Located	5.313	1.029	5.396	1.416	5.304	1.253

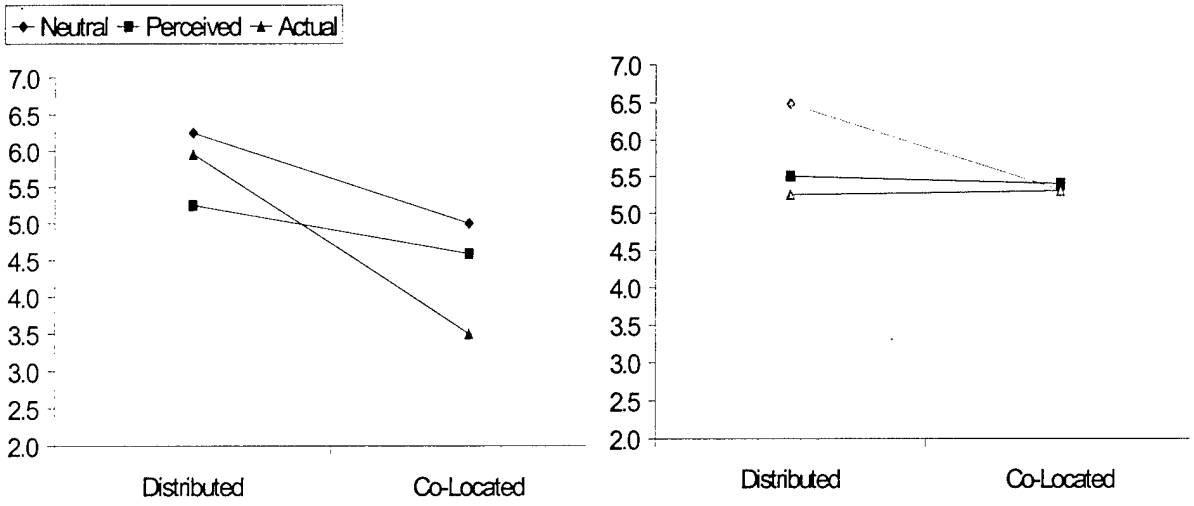


Figure 4.6 Plot of treatment means for user perceptions of fairness of GSS design without and with video.

ANOVA results for treatment groups without video indicated an interaction between facilitator alignment and facilitator location ($F(2, 74) = 3.032$, $p = 0.027$, $eta^2 = .08$), therefore further analysis was required to isolate the location effect.

Results from the ANOVA for treatment groups without video where the facilitator was distributed from all members showed a negative effect for facilitator alignment $F(2, 38) = 3.138$, $p = 0.028$, $eta^2 = 0.15$. Actual and perceived facilitator alignment

groups recorded means of 5.958 (s = 1.22) and 5.250 (s = 1.219), respectively, whereas groups where the facilitator was not aligned recorded a mean of 6.250 (s = 0.612). Planned comparisons using a Helmert contrast to control for experiment-wise error also showed a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions (p = 0.035). No statistically reliable difference was found between the perceived and actual alignment conditions.

Results from the ANOVA for treatment groups without video where the facilitator was co-located with a single meeting member also showed a negative effect for facilitator alignment ($F(2, 36) = 3.220$, $p = 0.026$, $eta^2 = 0.16$). Actual and perceived facilitator alignment groups recorded means of 3.500 (s = 1.424) and 4.583 (s = 1.346), respectively, whereas groups where the facilitator was not aligned recorded a mean of 5.000 (s = 1.5411). Planned comparisons using a Helmert contrast to control for experiment-wise error also showed a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions (p = 0.031). However, a non-hypothesized difference was found between the perceived and actual alignment conditions (p = 0.045).

Co-location of the facilitator also had a strong negative effect on user perceptions of fairness of the GSS design $F(1, 74) = 24.821$, $p < 0.001$, $eta^2 = 0.27$). Co-located groups recorded a mean of 4.444 (s = 1.535) whereas groups where the facilitator was distributed from all meeting members recorded a mean of 5.842 (s = 1.091).

Results from the ANOVA for treatment groups with video showed that facilitator alignment ($F(2, 74) = 1.866$, $p = 0.081$, $eta^2 = 0.05$) and facilitator location

($F(1, 74) = 2.281$, $p = 0.068$, $eta^2 = .03$) have no statistically reliable effect on user perceptions of fairness of the GSS design. Additionally, there was no evidence of an interaction between facilitator alignment and location ($F(2, 74) = 1.992$, $p = 0.072$, $eta^2 = .06$).

This implies that when the facilitator was either aligned or co-located with a single meeting member or both, video reduced user perceptions that the design of the GSS was less equitable.

4.4 Group Member Attitudes toward the Facilitator, Group, and GSS

4.4.1 User Satisfaction with Facilitator

Summary results for user satisfaction with the facilitator are provided in Table 4.10 and Figure 4.7, below.

Table 4.10

Means and Standards Deviations for User Satisfaction with Facilitator

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.173	1.090	5.771	0.780	5.823	0.963
Co-Located	6.327	0.537	5.708	1.206	5.677	1.052

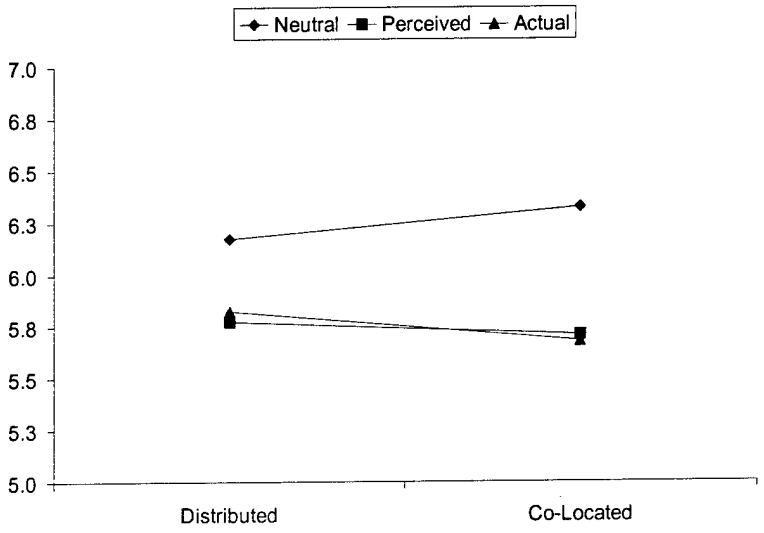


Figure 4.7 Plot of treatment means for user satisfaction with facilitator.

ANOVA results show that alignment of the facilitator had a negative effect on user satisfaction with the facilitator. Actual and perceived alignment of the facilitator with a single-meeting member recorded means of 5.750 (s = 1.000) and 5.740, (s = 1.005), respectively, as compared to a mean of 6.250 (s = 0.855) for groups in which the facilitator was not aligned. This effect was found to be statistically reliable, ($F(2, 148) = 4.451$, $p = .007$, $eta^2 = .061$). Planned comparisons using a Helmert contrast to control for experiment-wise error also showed a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions (p = 0.001). No statistically reliable difference was found between the perceived and actual alignment conditions. In contrast, the co-location of the facilitator with an individual (m = 5.916, s = 0.999) appeared to have no effect ($F(1, 148) = .027$, $p = .436$, $eta^2 = .000$) on user satisfaction as compared with groups in which the facilitator was distributed from member members (m = 5.929, s = 0.961).

A statistically reliable interaction effect was not evidenced for facilitator alignment and location, $F(2, 148) = 0.328$, $p = 0.360$, $eta^2 = 0.005$). In addition, there was also no interaction evidenced for facilitator alignment, location and video, $F(2, 148) = 0.173$, $p = 0.420$, $eta^2 = 0.003$. Groups in which the facilitator was co-located and aligned with a single group member were not any less satisfied with the facilitator than in other treatment groups.

4.4.2 User Belief in GSS Utility

A review of the ANOVA showed a three-way interaction effect between facilitator alignment, facilitator location, and video ($F(2, 148) = 3.230$, $p = 0.021$, $eta^2 = 0.05$). Due to the interaction of the video variable, further analysis was required. Summary results for user belief in utility of GSS without and with video were separated and are provided in Tables 4.11 – 4.12, below and next page. The interaction plots for both without and with video appear on Figure 4.8, next page.

Table 4.11

Means and Standards Deviations for User Belief in GSS Utility without Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.125	0.771	6.167	0.634	5.979	0.962
Co-Located	6.241	0.518	5.917	0.925	5.625	0.626

Table 4.12

Means and Standards Deviations for User Belief in GSS Utility with Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.125	0.719	5.625	0.822	5.750	0.989
Co-Located	5.729	0.822	6.146	0.559	6.304	0.582

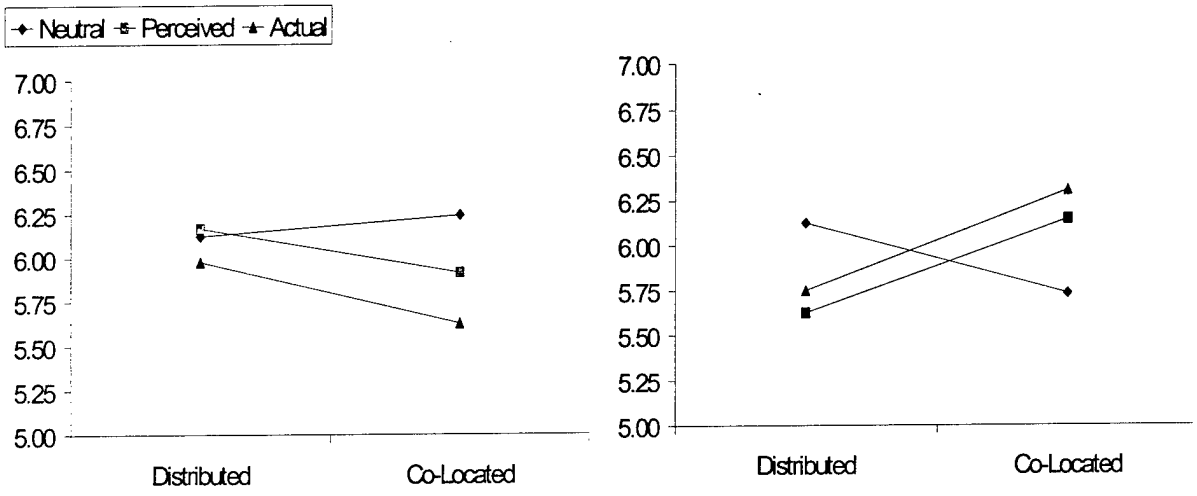


Figure 4.8 Plot of treatment means for user belief in GSS utility without and with video.

Results from the ANOVA for treatment groups without video indicated no interaction between facilitator alignment and location ($F(2, 74) = 0.604$, $p = 0.275$, $eta^2 = .02$). Furthermore, there was no statistically reliable difference between the means of the alignment groups. Similarly, location of the facilitator had no effect on user belief in GSS utility ($F(1,74) = 0.944$, $p = 0.167$, $eta^2 = .014$.)

Results with video indicate an interaction between facilitator alignment and location ($F(2, 74) = 3.070$, $p = 0.021$, $eta^2 = 0.08$, therefore further analysis was required to isolate the location effect.

ANOVA results for treatment groups with video where the facilitator was distributed from all members showed no facilitator alignment effect ($F(2, 36) = 1.123$, $p = 0.168$, $eta^2 = 0.06$). However, results where the facilitator was co-located with a single meeting member showed that facilitator alignment had a positive effect, ($F(2, 38) = 2.553$, $p = 0.046$, $eta^2 = 0.127$). Actual and perceived facilitator alignment groups recorded marginal means of 6.304 ($s = 0.582$) and 6.146 ($s = 0.559$), respectively, whereas groups where the facilitator was not aligned recorded a lower marginal mean of 5.7292 ($s = 0.822$). Planned comparisons using a Helmert contrast to control for experiment-wise error also showed a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions ($p = 0.019$). No statistically reliable difference was found between the perceived and actual alignment conditions. This implies that when the facilitator was aligned and co-located with a single meeting member, video increased the user's belief in the utility of the GSS.

4.4.3 User Satisfaction with Dynamics of Participant Group

Results of the ANOVA showed two interactions. An interaction effect was evidenced for facilitator alignment and video ($F(2, 148) = 2.855$, $p = 0.030$, $eta^2 = 0.04$), and a second interaction was evidenced for facilitator location and video $F(1, 148) = 5.349$, $p = 0.011$, $eta^2 = 0.04$. Summary results for user satisfaction with the dynamics of participant group without and with video are provided in Tables 4.13 - 4.14, below. The interaction plots for both without and with video appear on Figure 4.9, next page.

Table 4.13

Means and Standard Deviations for User Satisfaction with Dynamics of Participant Group Without Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.429	0.600	6.521	0.310	6.333	0.597
Co-Located	6.518	0.433	6.625	0.392	5.825	0.667

Table 4.14

Means and Standard Deviations for User Satisfaction with Dynamics of Participant Group With Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.229	0.956	5.688	0.960	5.938	1.149
Co-Located	6.292	0.582	6.354	0.405	6.429	0.485

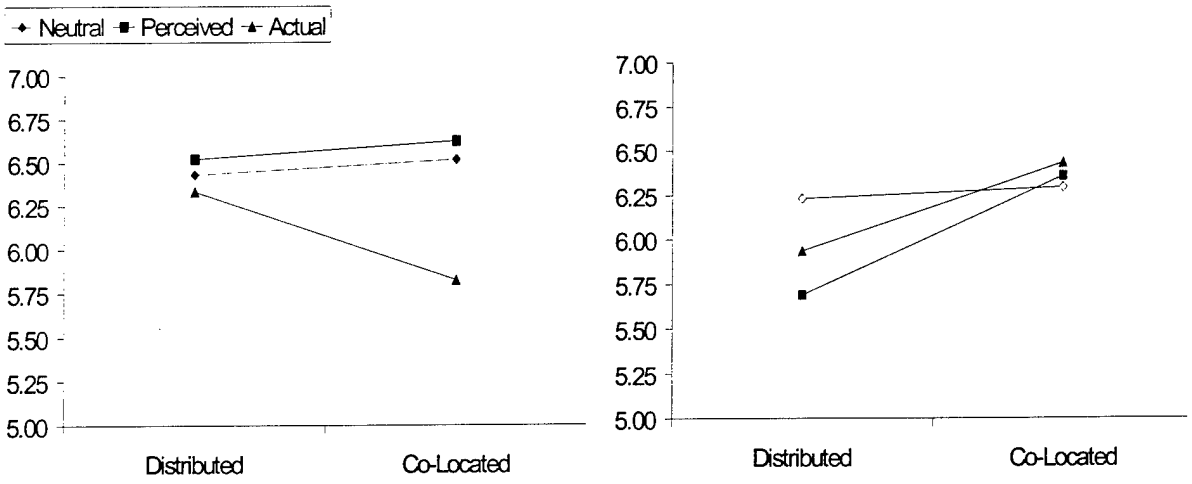


Figure 4.9 Plot of treatment means for user satisfaction with dynamics of participant group without and with video.

Results of the ANOVA for treatment groups without video indicated an interaction between facilitator alignment and location ($F(1, 74) = 2.686$, $p = 0.037$, $eta^2 = .07$), therefore further analysis was required to isolate the location effect.

Results from the ANOVA for treatment groups without video where the facilitator was distributed from all members showed no facilitator alignment effect $F(2, 38) = .382$, $p = 0.342$, $eta^2 = .02$. However, results where the facilitator was co-located with a single meeting member showed a strong negative effect for facilitator alignment, ($F(2, 36) = 8.230$, $p < 0.001$, $eta^2 = 0.34$). Actual and perceived facilitator alignment groups recorded means of 5.825 ($s = 0.667$) and 6.625 ($s = 0.392$), respectively, whereas groups where the facilitator was not aligned recorded a mean of 6.518 ($s = 0.433$). Planned comparisons using a Helmert contrast to control for experiment-wise error also showed a statistically reliable difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions ($p = 0.047$). However, a non-hypothesized difference was found between the perceived and actual alignment conditions ($p = 0.001$).

Results from the ANOVA for treatment groups with video indicated that there was no facilitator alignment effect $F(2, 74) = 0.565$, $p = 0.285$, $eta^2 = .02$). Although the facilitator alignment effect was reduced in groups where video was employed, the use of video introduced a main effect for location ($F(1, 74) = 4.790$, $p = 0.016$, $eta^2 = 0.07$). Co-location of the facilitator with a single meeting member with video registered a mean of 6.362 ($s = 0.485$) as compared to a mean of 5.951 ($s = 1.021$) where the facilitator was distributed from all meeting members.

4.4.4 User Satisfaction with Ease of Use of the GSS

A review of the ANOVA showed a three-way interaction effect between facilitator alignment, location, and video ($F(2, 148) = 3.178$, $p = 0.022$, $eta^2 = 0.05$). Due to the interaction of the video variable, further analysis was required. Summary results of the ANOVA for user satisfaction with ease of use of the GSS without and with video are provided in Tables 4.15 – 4.16, below and next page. The interaction plots for both without and with video appear on Figure 4.10, next page.

Table 4.15

Means and Standard Deviations for User Perception of Ease of Use of the GSS without Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.321	0.568	6.375	0.483	6.236	0.579
Co-Located	6.500	0.502	6.375	0.319	5.917	0.453

Table 4.16

Means and Standard Deviations for User Perception of Ease of Use of the GSS with Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	6.361	0.460	5.792	0.769	5.958	0.708
Co-Located	6.222	0.509	6.250	0.500	6.369	0.449

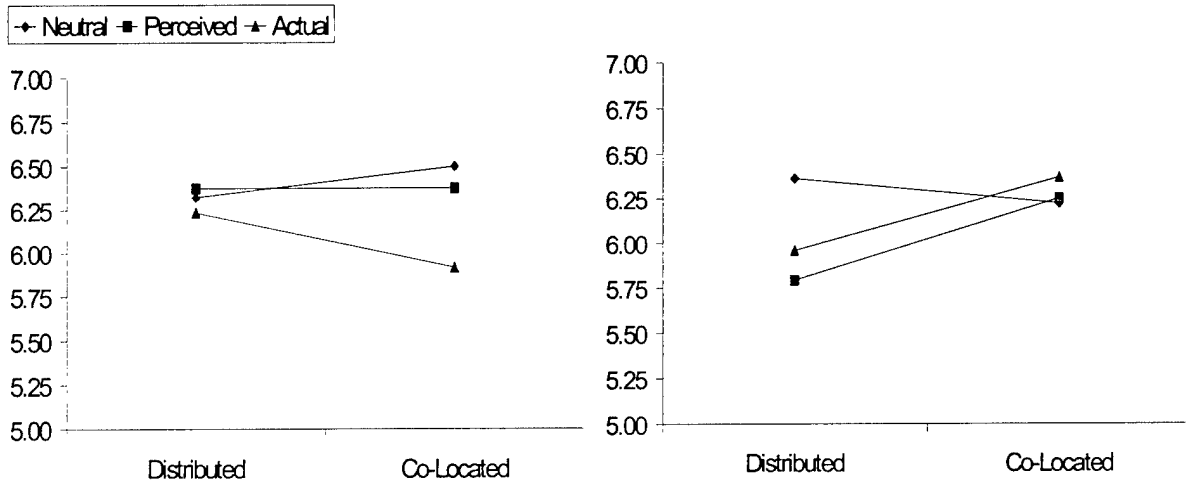


Figure 4.10 Plot of treatment means for user satisfaction with ease of use of the GSS without and with video.

Results recorded from treatment groups without video indicate facilitator alignment has a negative effect on user satisfaction with the ease of use of the GSS ($F(2,74) = 3.144$, $p = 0.24$, $eta^2 = .09$). Actual and perceived alignment of the facilitator with a single-meeting member in the non-video treatment groups recorded means of 6.091 ($s = 0.539$) and 6.375 ($s = 0.400$), respectively as compared to a mean of 6.411 ($s = 0.543$) for groups where the facilitator was not aligned. Planned comparisons using a Helmert contrast to control for experiment-wise error did not show a statistically reliable

difference between the mean of the neutral condition and the combined means of the perceived and actual alignment conditions, the p-value is close ($p = 0.063$). However, a non-hypothesized difference was found between the perceived and actual alignment conditions ($p = 0.023$). Co-location of the facilitator with an individual ($m = 6.296$, $s = 0.488$) appeared to have no effect ($F(1, 74) = 0.161$, $p = 0.345$, $eta^2 = .002$) on user satisfaction with the ease of use of the GSS as compared to groups in which the facilitator was distributed from all meeting members ($m = 6.311$, $s = 0.541$).

The ANOVA results for treatment groups with video show that the alignment of the facilitator with a single meeting member ($F(2, 74) = 1.328$, $p = 0.136$, $eta^2 = .04$) has no effect on user satisfaction with the ease of use of the GSS.

This implies that when the facilitator was aligned with a single meeting member, video reduced the lowered satisfaction levels for the ease of use of the GSS. In contrast, the co-location of the facilitator with an individual ($m = 6.285$, $s = 0.476$) appeared to have a slight positive effect ($F(1, 74) = 3.292$, $p = 0.037$, $eta^2 = .05$) on user satisfaction with the ease of use of the GSS as compared with groups in which the facilitator was not co-located with a group member ($m = 6.037$, $s = 0.684$).

4.5 User Behavior – Time Remaining After All Data Passed

A review of the ANOVA showed a three-way interaction effect between facilitator alignment, location, and video ($F(2, 146) = 3.908$, $p = 0.011$, $eta^2 = 0.06$). Results from the ANOVA also indicated a negative main effect for video ($F(1, 146) = 3.320$, $p < 0.036$, $eta^2 = 0.20$) on user behavior for treatment groups without video ($m = 17.167$, $s = 4.9986$) as compared to groups where video was employed

(m = 11.838, s = 6.340). This implies treatments groups with video were slower to transmit data than those treatment groups without video.

Due to the interaction of the video variable, further analysis was required. Summary results of the ANOVA for user satisfaction with ease of use of the GSS without and with video are provided in Tables 4.17 – 4.18, below. The interaction plots for both without and with video appear on Figure 4.11, next page.

Table 4.17

Means and Standard Deviations for Time Remaining After All Data Passed without Video (Expressed as time left in minutes when all data was passed)

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	15.571	5.734	17.600	4.452	17.167	2.443
Co-Located	18.714	4.177	20.500	2.067	12.800	6.941

Table 4.18

Means and Standard Deviations for Time Remaining After All Data Passed with Video (Expressed as time left in minutes when all data was passed)

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	13.500	8.130	8.667	5.710	9.500	7.052
Co-Located	12.333	5.710	13.667	5.805	13.143	4.688

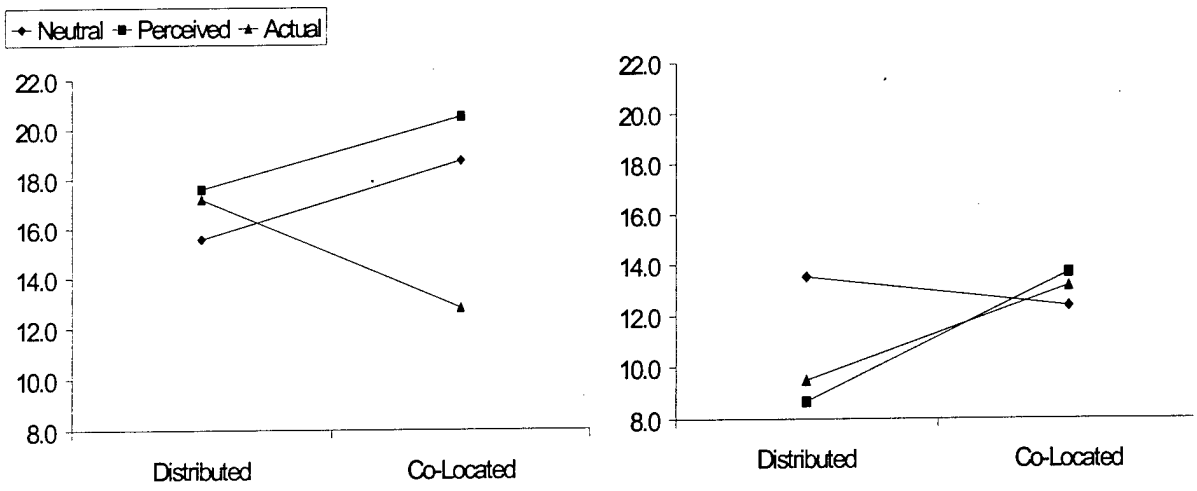


Figure 4.11 Plot of treatment means for time remaining after all data passed without and with video (expressed as time left in minutes when all data was passed).

Results of the ANOVA for treatment groups without video indicate an interaction between facilitator alignment and location ($F(2, 72) = 4.980$, $p = 0.005$, $eta^2 = 0.13$), therefore further analysis was required to isolate the location effect.

Results from the ANOVA for treatment groups without video where the facilitator was distributed from all members showed no facilitator alignment effect ($F(2, 36) = 0.700$, $p = 0.252$, $eta^2 = 0.04$).

Results from the ANOVA without video treatment groups where the facilitator was co-located with a single meeting member showed that facilitator alignment had an effect. Actual and perceived facilitator alignment groups recorded marginal means of 12.800 ($s = 6.941$) and 20.500 ($s = 2.067$), respectively, whereas groups where the facilitator was not aligned recorded a lower marginal mean of 18.7143 ($s = 4.1774$). However, planned comparisons using a Helmert contrast to control for experiment-wise error did not show a statistically reliable difference between the mean of the neutral

condition and the combined means of the perceived and actual alignment conditions ($p = 0.101$). Further, a non-hypothesized difference was found between the means of perceived and actual alignment ($p = 0.000$).

Results from the ANOVA for treatment groups with video showed that facilitator alignment ($F(2, 74) = 0.584$, $p = 0.28$, $eta^2 = 0.02$) had no statistically reliable effect on user behavior. Also, there was no evidence of an interaction between facilitator alignment and location ($F(2, 74) = 1.626$, $p = 0.102$, $eta^2 = .05$). This implies that when the facilitator was either aligned with a single meeting member, video reduced differences in the speed of task completion between the treatment groups.

Contrary to our hypothesis, results with video indicated a positive effect for location, ($F(1,72) = 2.941$, $p = 0.045$, $eta^2 = 0.04$). Co-location of the facilitator with a single-meeting member recorded a higher mean of 13.052 ($s = 5.267$), as compared with groups in which the facilitator was distributed from all meeting members ($m = 10.556$, $s = 7.157$).

4.6 Decision Quality

Summary results for Decision Quality without and with video are provided in Tables 4.19 – 4.20 and Figure 4.12, below.

Table 4.19

Means and Standard Deviations for Decision Quality without Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	7.285	0.102	7.319	0.048	7.305	0.096
Co-Located	7.333	0.000	7.333	0.000	7.333	0.000

Table 4.20

Means and Standard Deviations for Decision Quality with Video

	Neutral		Perceived		Actual	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distributed	7.236	0.207	7.277	0.193	6.777	1.240
Co-Located	7.319	0.048	7.319	0.048	7.321	0.044

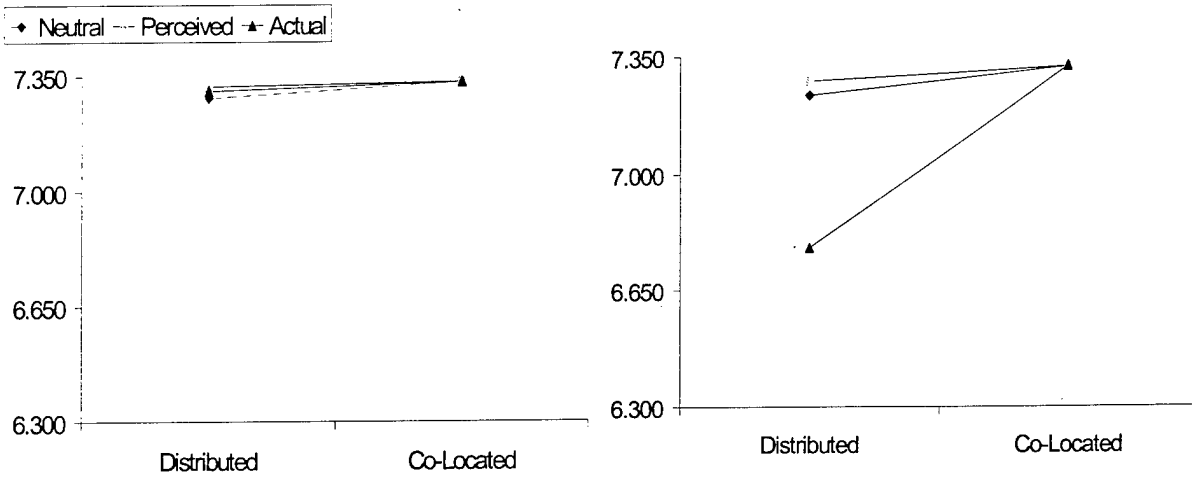


Figure 4.12 Plot of treatment means for decision quality without and with video.

Results from the ANOVA showed main effects for facilitator location and video. Facilitator alignment with a single meeting member did not register an effect on decision quality ($F(2, 148) = 1.715$, $p = 0.092$, $eta^2 = 0.03$). However, there was a slight positive effect for decision quality ($F(1, 148) = 4.397$, $p = 0.019$, $eta^2 = 0.03$) when the facilitator was co-located with a single meeting member ($m = 7.326$, $s = 0.033$) as compared to groups in which the facilitator was distributed from all group members ($m = 7.202$, $s = 0.532$). Results also indicated a negative effect ($F(1, 148) = 3.320$, $p = 0.036$, $eta^2 = 0.02$) on decision quality for treatment groups without video ($m = 7.317$, $s = 0.0063$) as compared to groups where video was employed ($m = 7.211$, $s = 0.532$).

4.7 Between-study comparison of co-location and perceived alignment treatments

4.7.1 User Justice Perceptions

A third of the treatments in this study were replications of Lea's 1998 research. Comparisons were made between the research efforts to validate the initial study. The four measured variables of the user justice perceptions construct are facilitator neutrality, equality of power distribution, group synergy, and fairness of GSS design. It is important to keep in mind that the comparisons will not include *actual* alignment or with-video treatments.

Summary of Effect Size and Statistical Significance for Lea (1998) and this study are provided in Tables 4.21 and 4.22, on the following pages.

Table 4.21

Summary of Effect Size and Statistical Significance for Lea's 1998 Study (Co-location and Perceived Alignment Treatments)

	Strength of Effect (eta^2)		
	Alignment	Location	Align * Location Interaction
User Justice Perceptions			
Facilitator Neutrality	0.050	0.290 **	0.040
Equality of Power Distribution	0.130 **	0.050	0.020
Group Synergy	0.050	0.160 **	0.000
Fairness of GSS Design	0.180 **	0.080 *	0.020
User Attitudes			
Satisfaction with the Facilitator	0.030	0.030	0.100 **
Belief in GSS Utility	0.000	0.000	0.010
Satisfaction with Group Dynamic	0.100 **	0.100 **	0.010
User Behavior	0.000	0.170 **	0.000
Decision Quality	0.000	0.080 *	0.030

* $p < .05$, ** $p < .01$

Table 4.22

Summary of Effect Size and Statistical Significance for 1999 Study (Co-location and Perceived Alignment Treatments)

	Strength of Effect (eta^2)		
	Alignment	Location	Align * Location Interaction
User Justice Perceptions			
Facilitator Neutrality	0.265**	0.003	0.009
Equality of Power Distribution	0.055!	0.073*	0.000
Group Synergy	0.029	0.006	0.024
Fairness of GSS Design	0.083*	0.142**	0.015
User Attitudes			
Satisfaction with the Facilitator	0.072*	0.004	0.003
Belief in GSS Utility	0.008	0.003	0.015
Satisfaction with Group Dynamic	0.013	0.012	0.000
User Behavior	0.048	*(0.113**)*	0.000
Decision Quality	0.022	*(0.071*)*	0.022

! $p < .06$, * $p < .05$, ** $p < .01$
(positive effect)

Lea's study, represented by Table 4.21, showed *perceived* alignment had a weak negative effect on user's perceptions of *facilitator neutrality* ($eta^2 = 0.05$). This study, represented by Table 4.22, also found a negative and much stronger effect on *facilitator neutrality* ($eta^2 = 0.265$). Lea also found co-location of the facilitator with a meeting member had a strong negative effect on *facilitator neutrality* ($eta^2 = 0.290$). However, this study found no statistical evidence to support that claim ($eta^2 = 0.05$). Finally, both studies found no interaction between *perceived* alignment and co-location of the facilitator as it pertained to *facilitator neutrality*.

Results for *equality of power distribution*, showed *perceived* alignment had a moderately negative impact in Lea's study and a slightly negative impact in this study. Both studies showed that *equality of power distribution* was negatively impacted by co-location of the facilitator. Neither study showed an interactive effect on *equality of power distribution* from *perceived* alignment and co-location of the facilitator.

Group synergy from Lea's study showed no negative effects from either *perceived* alignment or co-location of the facilitator. Yet, this study showed *group synergy* had a weak negative effect from *perceived* alignment and a strong negative effect from co-location of the facilitator. Once again, neither study showed an interactive effect on group synergy from *perceived* alignment or co-location of the facilitator.

The final discrete variable for user justice perceptions was *fairness of GSS design*. Lea's study showed a strong negative effect from *perceived* alignment and a weak negative effect from co-location of the facilitator. *Fairness of the GSS design* for this study had a weak negative effect from *perceived* alignment and had a much stronger negative effect from facilitator co-location. No interactive effects were evident on *fairness of GSS design* for either study.

4.7.2 User Attitudes

Similar to the first construct, user attitudes were broken down into discrete variables. The first of three variables, *satisfaction with the facilitator*, showed no negative effect from respondents based on either *perceived* alignment or facilitator co-location according to Lea's study. This study showed a slightly negative effect on *facilitator satisfaction* from *perceived* alignment but there was no statistical evidence to

support an effect for facilitator co-location. Lea's study showed a statistically reliable interactive effect from both perceived alignment and facilitator co-location. However, results from this study showed no interactive effects.

The second variable measuring user attitudes was *belief in GSS utility*. Both studies found no statistical reliable evidence supporting any negative effects from *perceived* alignment, co-location, or an interactive effect between the two.

Finally, Lea's study found that both *perceived* alignment and co-location of the facilitator negatively effected user *satisfaction with group dynamics*. However, this study found no statistical evidence to support Lea's findings. Again, neither study found an interactive effect between both *perceived* alignment and facilitator co-location as they related to *satisfaction with group dynamics*.

4.8 Summary

This chapter presented results from the analysis performed on data collected through survey administration and direct observation of experiment participants for evaluation of the success of manipulations included in the experimental design. The results of this analysis effort, with the exception of the facilitator alignment and location manipulation checks, are presented in Tables 4.23 – 4.24, below. Chapter V discusses these results in terms of the research hypotheses of interest to this research study.

Table 4.23

Summary of Effect Size and Statistical Significance without Video

	Strength of Effect (eta ^{2})		
	Alignment	Location	Align * Location Interaction
User Justice Perceptions			
Facilitator Neutrality	0.261**	0.036	0.041
Equality of Power Distribution	0.074*	0.110**	0.011
Group Synergy	0.120**	0.007	0.060
Fairness of GSS Design	0.097*	0.267**	0.082*
User Attitudes			
Satisfaction with the Facilitator	0.081*	0.000	0.012
Belief in GSS Utility	0.041	0.014	0.017
Satisfaction with Group Dynamic	0.149	0.011	0.073
Ease of Use	0.085	0.002	0.043
User Behavior	0.116	0.004	0.131
Decision Quality	0.014	0.058*	0.014

* $p < .05$, ** $p < .01$

Table 4.24

Summary of Effect Size and Statistical Significance with Video

	Strength of Effect (eta^2)		
	Alignment	Location	Align * Location Interaction
User Justice Perceptions			
Facilitator Neutrality	0.245**	0.012	0.006
Equality of Power Distribution	0.019	0.001	0.480
Group Synergy	0.066	0.015	0.102
Fairness of GSS Design	0.053	0.033	0.056
User Attitudes			
Satisfaction with the Facilitator	0.046	0.001	0.002
Belief in GSS Utility	0.007	0.024	*(0.083*)*
Satisfaction with Group Dynamic	0.016	*(0.066*)*	0.026
Ease of Use	0.038	*(0.046*)*	0.056
User Behavior	0.017	*(0.041*)*	0.046
Decision Quality	0.051	*(0.049*)*	0.052

* $p < .05$, ** $p < .01$

(positive effect)

V. Conclusions and Recommendations

5.1 Introduction

The results of this study have largely supported the theory that increased communication capabilities provided by video intervention could neutralize negative effects of structural and social justice due to facilitator location and alignment, respectively. This study suggested that without video, as partially supported by Lea, facilitator alignment and location would have a negative effect on user justice perceptions, user attitudes, user information-sharing behavior, and group decision quality. In order to examine this hypothesis, the variables for the main and interactive effects of facilitator alignment, co-location, and video intervention were controlled to determine their impact on the group process and process outcomes as described in Chapter II. Finally, this chapter will include an overall conclusion of the research findings, as well as limitations of the study and overall recommendations for future research.

5.2 Hypothesis 1: Interactive effects of Facilitator Co-location and Video Intervention

Hypothesis 1 proposed that video intervention and co-location of the facilitator with a single meeting member in a GSS would have an interactive effect, reducing the negative impact co-location has on user' justice perceptions, their attitudes towards the efficacy of GSS, information sharing behavior, and group decision quality. For ease of understanding, hypothesis one is broken into four separate sub-hypotheses.

5.2.1 Hypothesis 1a

Hypothesis 1a suggested that video intervention and co-location of the facilitator with a single meeting member in a GSS would have an interactive effect, reducing the negative impact co-location has on *user justice perceptions.* Again, user justice perceptions are broken down into four discrete variables; those being facilitator neutrality, equality of power distribution, group synergy, and fairness of GSS design. Data analysis from Chapter IV of this study fully supports two of the four hypotheses to include equality of power distribution and fairness of GSS design.

A review of the ANOVA results from Chapter IV shows the hypothesis for *facilitator neutrality* was partially supported. The data suggest that co-location had a slight negative effect on *facilitator neutrality.* However, video intervention failed to mitigate this effect. Co-location of the facilitator with a single meeting member also registered a negative effect on user perceptions of *equality of power distribution* among experiment participants. As hypothesized, video reduced the less than equal perceptions of *equality of power distribution* between group members. Co-location of the facilitator appeared to have had no statistically reliable effect on user perceptions of *group synergy,* regardless of video intervention. Finally, co-location of the facilitator had a strong negative effect on user perceptions of *fairness of the GSS design.* As hypothesized, video reduced user perceptions that the co-located design of the GSS was less equitable than an all-distributed GSS.

5.2.2 Hypothesis 1b

Hypothesis 1b suggests video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on user perceptions of the efficacy of GSS technology. Recalling from Chapter II, the efficacy of GSS technology is measured from four discrete variables. They are satisfaction with the facilitator, belief in the GSS utility, satisfaction with group dynamics, and ease of use of the GSS.

A review of the ANOVA results from Chapter IV suggests that the co-location of the facilitator with an individual appeared to have no effect on user *satisfaction of the facilitator* across all treatments, regardless of video intervention. Similarly, in both video and non-video treatments, co-location of the facilitator had no effect on user *belief in GSS utility*. Co-location of the facilitator with a meeting member had no effect on user *satisfaction with group dynamics* in the non-video treatments. However, an interesting finding showed users registered a **positive** effect on *satisfaction with group dynamics* when there was video present in the co-located treatments. Although a reduction in negative perceptions was hypothesized, a positive effect was not hypothesized. Likewise, co-location had no effect on *ease of use of the GSS* without video but a **positive** effect was again found when video was added. The positive effect may stem from an increased peace-of-mind provided by video. Since users were already initially aware of the possibility of a negative impact resulting from the co-location of the facilitator, they did not have any additional negative perceptions about the co-location manipulation. Instead users felt video gave them more control since they could see no external communication

taking place outside of the GSS. As such, they were more *satisfied with the group dynamics* and felt better about the *ease of use of the GSS* in these instances.

5.2.3 Hypothesis 1c

Hypothesis 1c suggests that video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on user information-sharing behavior. The results from the ANOVA showed no effect due to facilitator co-location with a single meeting member, providing no support for the above hypothesis. This result may be due to the lack of variability in the collected data points. The vast majority of participants tended to share their information in the allotted time regardless of the location of the facilitator.

5.2.4 Hypothesis 1d

Hypothesis 1d suggests that video intervention and co-location of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location has on group decision quality. The results from the ANOVA for facilitator co-location with a single meeting member do not support the above hypothesis. However, this may be due to the lack of variability in the collected data points. The vast majority of groups reached the correct decision in the allotted time regardless of the location of the facilitator.

5.3 Hypothesis 2: Effects of Facilitator Alignment (perceived or actual) and Video Intervention

Hypothesis 2 proposed that video intervention and alignment of the facilitator with a single meeting member in a GSS would have an interactive effect, reducing the negative impact co-location has on user justice perceptions, their attitudes towards the efficacy of GSS, information-sharing behavior, and group decision quality. For ease of understanding, hypothesis one is broken into four separate sub-hypotheses.

5.3.1 Hypothesis 2a

Hypothesis 2a suggests that video intervention and facilitator alignment (*perceived* and *actual*) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (*perceived* and *actual*) has on user justice perceptions. As stated earlier in Chapter V, the four measured variables of the user justice perceptions construct are facilitator neutrality, equality of power distribution, group synergy, and fairness of GSS design.

Partially supportive of the hypothesis, ANOVA results showed alignment (*perceived* and *actual*) of the facilitator with a single meeting member had a strong negative effect on user *perceptions of facilitator neutrality.* Video intervention, however, failed to reduce the negative effect. A review of the ANOVA results also showed alignment of the facilitator (*perceived* and *actual*) with a single meeting member had a slight negative effect on user perceptions of *equality of power distribution* among experiment participants. As hypothesized, video reduced the negative results. For user perceptions of *group synergy*, results from the ANOVA of treatment groups without

video indicated that the alignment of the facilitator (*perceived* and *actual*) with a single meeting member had a negative effect. The addition of video did not mitigate the negative effects as hypothesized. Likewise, results from the ANOVA of without-video treatments for *fairness of GSS design* showed a negative effect from facilitator alignment, both *perceived* and *actual* but the addition of video did not mitigate the negative effects.

5.3.2 Hypothesis 2b

Hypothesis 2b suggests that video intervention and facilitator alignment (*perceived* and *actual*) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (*perceived* and *actual*) has on user perceptions of the *efficacy of the GSS technology*. As stated earlier in Chapter V, the four measured variables of GSS efficacy are satisfaction with the facilitator, belief in the GSS utility, satisfaction with group dynamics, and ease of use of the GSS.

Partially supportive of the hypothesis, ANOVA results show that alignment of the facilitator (*perceived* and *actual*) had a negative effect on user *satisfaction with the facilitator* regardless of the presence or absence of video. Also, alignment (*perceived* and *actual*) had no statistically reliable effect on user *belief in GSS utility* regardless of the presence or absence of video. *Satisfaction with group dynamics,* however, was negatively effected by alignment (*perceived* and *actual*) for those treatments without video and as hypothesized, the negative effect on *satisfaction with group dynamics* was mitigated when video was added. Finally, alignment (*perceived* and *actual*) had a slight negative effect on *ease of use of the GSS* in the non-video treatments, which was reduced with the presence of video.

5.3.3 Hypothesis 2c

Hypothesis 2c suggests that video intervention and facilitator alignment (*perceived* and *actual*) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (*perceived* and *actual*) has on user information-sharing behavior. The results from the ANOVA for facilitator alignment with a single meeting member did not support this hypothesis. This may be due to the lack of variability of collected data points. The vast majority of participants tended to share their information in the allotted time regardless of the alignment of the facilitator.

5.3.4 Hypothesis 2d

Hypothesis 2d suggests that video intervention and facilitator alignment (*perceived* and *actual*) with a single meeting member in a GSS will have an interactive effect, reducing the negative impact facilitator alignment (*perceived* and *actual*) has on group decision quality. The results from the ANOVA for facilitator alignment with a single meeting member did not support this hypothesis. This may be due to the lack of variability of collected data points. The vast majority of groups reached the correct decision in the allotted time regardless of the alignment of the facilitator.

5.4 Hypothesis 3: Interactive Effects of Facilitator Co-Location, Alignment (perceived or actual), and Video Intervention

Hypothesis 2 proposed that video intervention, co-location and alignment of the facilitator with a single meeting member in a GSS would have an interactive effect, reducing the negative impact co-location has on user justice perceptions, their attitudes towards the efficacy of GSS, information sharing behavior, and group decision quality. For ease of understanding, hypothesis one is broken into four separate sub-hypotheses.

5.4.1 Hypothesis 3a

Hypothesis 3a suggests video intervention, co-location and alignment (*perceived* and *actual*) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative effects co-location and alignment (*perceived* and *actual*) has on user justice perceptions, their attitudes towards the efficacy of GSS, information sharing behavior, and group decision quality. As stated earlier in Chapter V the four measured variables of the user justice perceptions construct are facilitator neutrality, equality of power distribution, group synergy, and fairness of GSS design. ANOVA results only show support for one of the four hypotheses: fairness of GSS design.

Review of the ANOVA results show that a statistically reliable interactive effect was not evidenced on *facilitator neutrality* from facilitator alignment (*perceived* and *actual*) and location, with or without video intervention. Results from the ANOVA showed co-location and alignment of the facilitator with a single meeting member also had no interactive effects on *equality of power distribution*, regardless of video

intervention. Although *group synergy*, the third variable, showed an interactive effect between location, alignment, and video intervention, this was not in support of our hypothesis. The interactive effect showed that when an aligned facilitator was distributed from all meeting members and video was used, user perceptions of group synergy actually increased. Finally, facilitator co-location and alignment had a negative interactive effect on *fairness of the GSS* in the non-video treatments and, as hypothesized the effect was reduced when video was added.

5.4.2 Hypothesis 3b

Hypothesis 3b suggests video intervention, co-location and alignment (*perceived* and *actual*) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative perceptions of co-location and alignment (*perceived* and *actual*) on efficacy of GSS technology. Recall from earlier in Chapter V that the four measured variables of GSS efficacy are satisfaction with the facilitator, belief in the GSS utility, satisfaction with group dynamics, and ease of use of the GSS.

ANOVA review shows that facilitator co-location and alignment had no interactive effect on *facilitator satisfaction* or *belief in GSS utility,* regardless of video intervention. However, as hypothesized co-location and alignment had a negative interactive effect on *satisfaction with group dynamics* without video and that effect was reduced with video. Finally, co-location and alignment had no interactive effects on *ease of use of GSS* with or without video.

5.4.3 Hypothesis 3c

Hypothesis 3c suggests video intervention, co-location and alignment (*perceived* and *actual*) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact of co-location and alignment (*perceived* and *actual*) on *user behavior*. The results from the ANOVA for facilitator alignment with a single meeting member does not support the above hypothesis; this may be due to the lack of variability of collected data points. This finding can most likely be attributed to the fact that the vast majority of participants shared their information in the allotted time.

5.4.4 Hypothesis 3d

Hypothesis 3d suggests video intervention, co-location and alignment (*perceived* and *actual*) of the facilitator with a single meeting member in a GSS will have an interactive effect, reducing the negative impact co-location and alignment (*perceived* and *actual*) has on group *decision quality*. No statistical evidence supported the hypothesis; co-location and alignment had no interaction effect on decision quality regardless of video intervention. This finding can most likely be attributed to the fact that the vast majority of groups reached the correct decision in the allotted time.

5.5 Conclusions and Recommendations

Overall conclusions of this study suggest that co-location of the facilitator with a single meeting member had moderate to strong negative effects on the structural determinants of user justice perceptions. As hypothesized, video intervention was able to

reduce the negative impact on user justice perceptions caused by co-location across all treatments. No evidence was available to support the premise that co-location had a negative effect on the support determinants of user justice perceptions or users attitudes towards the efficacy of GSS technology. Finally, co-location had no effect on user behavior regardless of video intervention while decision quality had a slight negative effect caused by co-location that was reduced with the addition of video.

Facilitator alignment (*perceived and actual*) with a single meeting member had a negative impact on group members' equality of power distribution, group synergy, and fairness of the GSS design. As hypothesized, video intervention reduced the negative effects for all three measures. However, alignment had no negative effects on user belief in GSS utility, satisfaction with group dynamics, and ease of use of the GSS, regardless of whether video was present or not. There was also no negative effect associated with user behavior and decision quality from the alignment, regardless of the presence of video.

Interactive effects were limited with the exception of negative interactive effects on both *satisfaction with group dynamics* and *fairness of the GSS* in the non-video treatments. As hypothesized, these effects were reduced with video.

Taken as a whole, the manipulations of this study produced negative perceptions toward the structure of the GSS design (fairness of system design, group synergy, and equity of user control). This in turn influenced the process (systemic justice) and process outcomes (configural justice). However, if the structure of GSS design is communicated to the users through video intervention, users can then determine that procedures are free

from bias and represent the concerns of all parties, and thus reduce any negative perceptions (Kramer, 1996:403-404, Greenberg, 1993:84-86).

Unlike Lea's (1998) study, the social/support determinants showed no negative effects from facilitator co-location or alignment. The findings of the current study, however, are consistent with Greenberg and Kramer's findings on information and interpersonal justice. As stated earlier in Chapter II, informational justice involves "providing knowledge about procedures that demonstrate regard for peoples' concern (Greenberg, 1993:84)." Interpersonal justice focuses on selfish behavior or a perception of failure to meet social obligations (Greenberg, 1993:85). Considering that no negative effects were measured from facilitator alignment and co-location suggests that because the facilitator and confederate in this study did not ignore peoples' concerns, answered questions, and freely shared requested information, there was no violation of informational or interpersonal justice. As such the participant groups had higher perceptions of social trust. This also suggests that if the facilitator violated trust through stronger or negative alignment, or the confederate didn't share information, that user's would register negative effects towards facilitator neutrality (information justice) and perceptions of group synergy (interpersonal justice) (Kramer, 1996:403-404, Greenberg, 1993:84-86).

This study demonstrated that video produced the desired effect of mitigating negative user justice perceptions and the resulting attitudes and behaviors. The use of video, however, is not without cost. On average the groups with video took more than 20 percent longer to transfer the information as compared to the groups without video.

5.6 Limitations and Recommendations for Future Research

A limitation of this study was the amount of time provided to participant groups to solve the task. Because this study was duplicated from Lea (1998), the researchers provided the same amount of time as the initial study. However, with the addition of a confederate, it was determined there was more process control, even if artificial. Because of this fact, every group was able to solve the task within the prescribed time. This allowed users to feel better about decisions because there was ample time to solve the task and in most cases, do a complete review of actual race winners. Subsequently, decision quality was artificially higher and there was no variability in the data across treatments. Likewise, there was no variability in user behaviors for similar reasoning. It was estimated that because most participants readily determined that they had effectively solved the task, their perceptions may have been less negative than those found by Lea.

A second limitation was that CUSeeMe video was not broadcast quality. As such, the video was not able to produce the same visual effects found in face-to-face meetings. However, video quality was not the focus of this study. It was only necessary for the participants to be able to see each other, as well as the ability to notice whether the facilitator was co-located or distributed with one of the meeting members.

Perhaps the greatest strength of GSS research is the diverse avenues of research opportunities. Video, in and of itself, is a dynamic variable and there is much to be learned from future studies about its use and effect in distributed GSS settings. For example, do users like having video and does it in fact provide higher levels of trust and self-efficacy. In information-sharing behaviors, does it increase or decrease their propensity to share? Post experimental discussions with some participants suggested that

video caused them to share information that initially they had planned on withholding. It was reasoned that because people could see, feelings of guilt started to arise about their self-serving behavior. Other questions or measures should perhaps focus on whether video increased or decreased the speed of information transfer. Further, if it decreased the information transfer rate over non-video GSS use, is there an impact on the quality of the decision.

Another area of research may focus on the specific information transferred. For example, in this study the exact amount of information needed for task completion was supplied between the three participants. Because decision-makers often make decisions without all available information, perhaps a new task should be developed with either information gaps (no information available for certain requirements) or more information (information overload) than decision-makers need to make a decision. Researchers should then focus on how GSS technology effects a group's ability to sift through all available information and determine which is useful in the decision-making.

5.7 Summary

Lea's (1998) study indicated that isolation of the facilitator from meeting members was desirable, and that obtaining a neutral facilitator could have a significant effect on the efficacy of GSSs when employed in a distributed environment. Lea further concluded that architects and users of GSS in the future should, as a minimum, make arrangements to obtain neutral agents to facilitate distributed meetings supported by these systems or in some manner influence the perceptions of meeting members to indicate facilitator neutrality. Additionally, Lea (1998) found that group member perceptions of

the relative fairness of the meeting process and meeting outcomes were influenced by aspects of the GSS structure, and the social interactions enabled and moderated by the GSS. Although the findings of this study support Lea's conclusions, they also moderate them in a profound way.

The Air Force DOME system is a GSS employed to aid the design and modeling of logistics processes between dispersed groups and installations. As such, engineers at AFRL were concerned that an arrangement in which the meeting facilitator may be aligned or co-located with a group member might negatively impact the group dynamic, resulting in a general distrust of the meeting process among the distributed group members. They were also concerned with issues such as cost and availability when securing the services of a neutral party to act as a facilitator for distributed meetings. In addition, the hired facilitator would have access to any sensitive information, which might be discussed or presented in these sessions (Anson et al., 1995:205).

This research suggests that the facilitator may not need to be physically separated from the decision group to ensure perceptions of neutrality. The findings imply that the facilitator can moderate a meeting while co-located with a meeting member within the same facility as long as video is used to mitigate the perceptions of intent and ability to bias in untrusting group members. The findings from this study suggest that a comparable system design can be accomplished with video, while minimizing the negative effects of co-location and alignment found in both studies.

Appendix A: Sport of Kings

Master and Participant Worksheet Matrices

Master Information Sheet
Race Information

Race Conditions		Info to:
Month	May	B
Post Time	1:00	B
Weather	Clear	C
Temperature	80s	C
Humidity	Medium	A
Track Condition	Dry	A
Length of Race	1 ¼ Mile	A
Crowd Size (S,M,L)	Large	B
Region (N,S,E,W)	East	C

Post Positions		Info to:	Pref. to:
Lane 1	Classy Lassie	A	C
Lane 2	Rebecca's Dream	B	A
Lane 3	Miss Zavalla	C	B
Lane 4	Cypress Queen	A	B
Lane 5	Dandy Courtin	B	A
Lane 6	Honey Sue	C	B
Lane 7	Ruthless Ruthie	A	C
Lane 8	Magic Rose	C	A
Lane 9	Fancy Free	B	C

Crowd Size	Info to:
Ruthless Ruthie	A
Honey Sue	C
Rebecca's Dream	C
Fancy Free	A,B
Classy Lassie	C
Cypress Queen	A
Dandy Courtin	C
Miss Zavalla	A
Magic Rose	C

Humidity	Info to:
Ruthless Ruthie	C
Honey Sue	B
Rebecca's Dream	B
Fancy Free	A,C
Classy Lassie	C
Cypress Queen	B
Dandy Courtin	B
Miss Zavalla	C
Magic Rose	C

Month	Info to:
Ruthless Ruthie	C
Honey Sue	A
Rebecca's Dream	C
Fancy Free	C
Classy Lassie	A
Cypress Queen	A
Dandy Courtin	C
Miss Zavalla	A
Magic Rose	C

Race Length	Info to:
Ruthless Ruthie	B
Honey Sue	B
Rebecca's Dream	C
Fancy Free	C
Classy Lassie	A
Cypress Queen	C
Dandy Courtin	C
Miss Zavalla	B
Magic Rose	B

Region	Info to:
Ruthless Ruthie	B
Honey Sue	A
Rebecca's Dream	A
Fancy Free	A
Classy Lassie	B
Cypress Queen	B
Dandy Courtin	A
Miss Zavalla	B
Magic Rose	A

Temp	Info to:
Ruthless Ruthie	A
Honey Sue	A
Rebecca's Dream	B
Fancy Free	B,C
Classy Lassie	B
Cypress Queen	A
Dandy Courtin	A
Miss Zavalla	B
Magic Rose	B

Time	Info to:
Ruthless Ruthie	C
Honey Sue	C
Rebecca's Dream	A
Fancy Free	A
Classy Lassie	B
Cypress Queen	C
Dandy Courtin	A
Miss Zavalla	C
Magic Rose	A

Track Condition	Info to:
Ruthless Ruthie	B
Honey Sue	C
Rebecca's Dream	B
Fancy Free	B
Classy Lassie	C
Cypress Queen	C
Dandy Courtin	B
Miss Zavalla	C
Magic Rose	B

Weather	Info to:
Ruthless Ruthie	A
Honey Sue	B
Rebecca's Dream	A
Fancy Free	B
Classy Lassie	A
Cypress Queen	B
Dandy Courtin	B
Miss Zavalla	A
Magic Rose	A

Appendix B: Sport of Kings Experimental Treatment 1 Handout

Sport of Kings Experiment

Introduction

This experiment is being conducted to collect data on users' assessment of a computer meeting system called a Group Support System, or GSS for short. GSS is a combination of networked computers and a human facilitator which allows groups of decision makers to work together in a virtual environment. Today you'll use GSS to work through the problem of identifying the three top finishers from a field of nine horses running in a fictional race called the Cooper Stakes. At the end of the experiment, each of you will bet individually on the horses you think will finish first, second, and third in the race, in exact order. This type of bet is called a *trifecta*.

Your bet will not be revealed to the other experiment participants.

Task Description

Chance and ability are not factors in the Cooper Stakes. Instead, race results have been predetermined and are known only to the facilitator. The horse whose racing preferences best match the conditions on race day will win the race. At each GSS workstation is a participant-specific racing form/worksheet that contains information about race conditions and preferences of the horses running in the race. During this experiment you'll have the opportunity to exchange information with the other experiment participants in order to build a better profile of each of the horses and make a more informed decision when it comes time to place your bet on the *trifecta*.

Your racing form contains some information shared by other experiment participants, and some known only to you. Your worksheet makes no distinction between the two. Trial-and-error will be your only means of determining if a piece of information is held by some other participant or is known to you alone.

The experiment has one other slight catch. Horse racing employs a betting scheme called *pari-mutuel* betting to determine odds on horses and payoffs for winning bets. According to this scheme, the higher the amount bet on a *trifecta*, the lower the odds on a bet and the lower the payoff to bettors if the *trifecta* hits.

The developer of the GSS is very interested in seeing the system perform well. For this reason he has entrusted the facilitator with an undisclosed sum to pay off winning bets. If the entire group manages to identify the winning *trifecta*, each participant will be paid $7.00 for his or her efforts, plus a bonus to be disclosed at the end of the experiment. In any other combination, however, individuals will be paid $9.00 for a correct bet. Participants who fail to identify the winning trifecta will receive no money for their efforts. This information is summarized in the table below.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Experimental Design

There are three participants in this experiment. Your name (Participant A, B, or C) will be prominently posted on the computer station you are assigned.

The meeting facilitator is not an experimental subject, but experiment administrator. As such, this individual controls the GDSS system, the distribution of instructions and information to experiment participants, participant activities, and the distribution of cash payments at the end of the session.

The setup of the GSS system is described in Figure 1. All meeting participants, including the facilitator, are located in separate facilities, isolated from each other as described below.

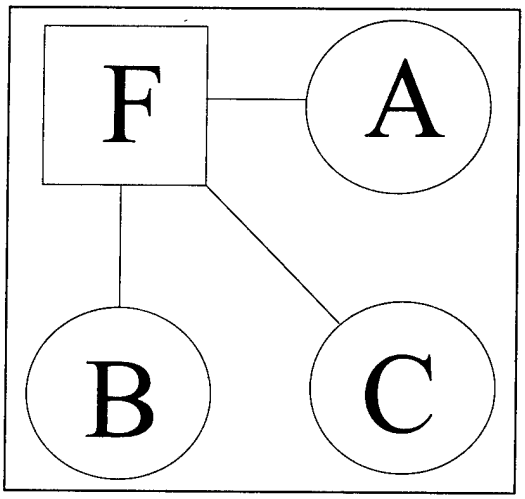


Figure 1. Physical Design of GDSS

All interaction and communication between participants A, B, and C and the facilitator will take form of broadcast messages transmitted over your telephone headset or the GSS. Neither the facilitator nor any experiment participant has the ability to communicate individually with another participant using these systems.

All comments submitted via the GSS will be marked with the contributor's name (Facilitator, Participant A, B, or C).

Continue to next page.

Choosing the Winners

Using the worksheet provided, you will match horses' preferences to the actual conditions of the race. If a horse's preference in a given category matches up to the respective condition on race day, you will award the horse a point for that category. For example, if Ruthless Ruthie likes racing on a muddy track and you determine that the track is muddy on the day of the race, you will award Ruthless Ruthie a point in the "Track Condition" category. See the example, below:

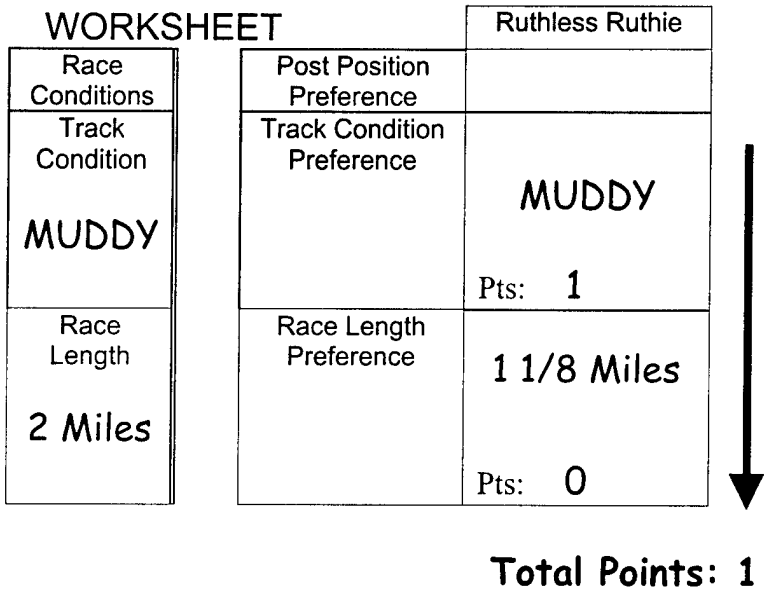
WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition **MUDDY**	Track Condition Preference	**MUDDY** Pts: **1**
Race Length	Race Length Preference	Pts:

If a horse's preference does not match up to the respective race condition, you will award the horse a score of zero for the respective category. For example, if you discover that Ruthless Ruthie likes running races which are 1 1/8 miles in length and you determine the Cooper Stakes is a 2 mile race, you will award her a score of zero in the "Race Length" category. See the example below:

WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition MUDDY	Track Condition Preference	MUDDY Pts: 1
Race Length **2 Miles**	Race Length Preference	**1 1/8 Miles** Pts: **0**

Continue to next page.

The race winner will be the horse whose preferences best match the 10 race conditions, that is, the horse with the highest score of 10 possible points. The second-place horse will have the second highest total of 10 possible points; the third-place finisher will have the third-highest total of 10 possible points. In our example (see below), Ruthless Ruthie has scored one out of two possible points.



Agenda

1. Participants read introductory materials.

2. Participants complete comprehension exercise at their workstations.

3. The facilitator describes task and demonstrates system operation to participants.

4. The facilitator enables GSS, allowing participants 40 minutes to discuss the experimental task as a group. The facilitator will monitor time and inform participants when 35, 30, 25, 20, 15, 10, 8, 5, 3, and 1 minute remain.

5. The facilitator allows participants 10 minutes to review comments submitted to the group.

6. Participants individually place bets on the race by completing the betting form provided. There is no time limit for this part of the experiment.

7. Participants complete a survey asking them about their interaction with other group members using GSS, their opinion of the usefulness of the system, and their satisfaction with the job done by the meeting facilitator. There is no time limit for this part of the experiment.

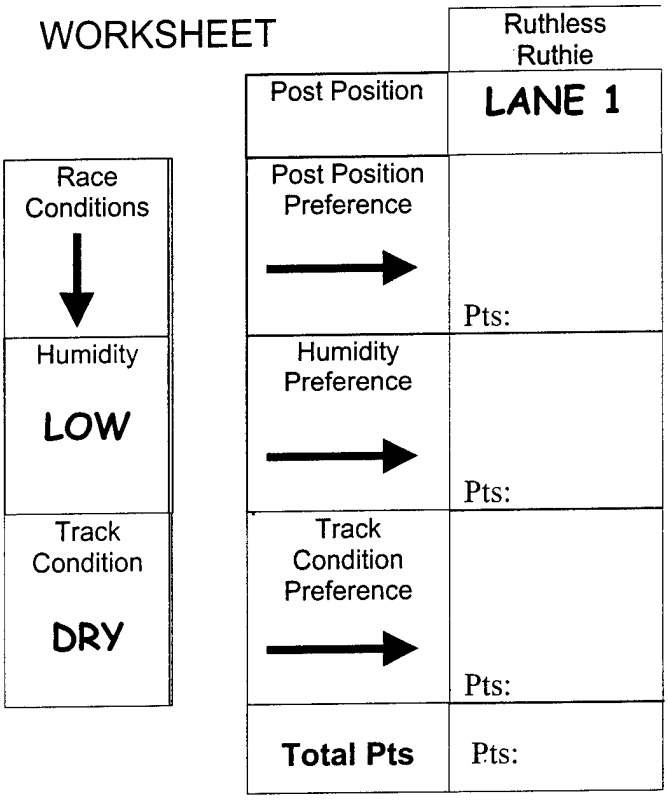
8. Facilitator collects experiment materials from participants and briefs each individually on the results and purpose of the experiment.

Exercise
Sport of Kings

Instructions: Working through the following exercise will sharpen the skills and understanding you will need to successfully perform Sport of Kings experimental tasks. Please answer all of the questions below. Feel free to ask the facilitator for help and/or clarification at any time. There is no time limit for this task..

1. Read the following paragraph and transcribe the information it contains to the worksheet. Use the worksheet to answer the question below. Circle the best answer.

Ruthless Ruthie - Runs best on a dry track. Prefers high humidity. Prefers running from Lane 1.



Q1 (Circle Best Answer): How many points should you award Ruthless Ruthie based on the information above?

A. 0 B. 1 C. 2 D. 3

Please Complete Questions 2 - 5, Next Page.

2. Use the chart below to answer Question 2.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Q2 (Circle True or False): If Participant A is the only participant to correctly identify the winning *trifecta* for the Cooper Stakes, he or she will be paid $9.00 at the end of the experiment and Participants B and C will receive no money for participating in the experiment.

TRUE FALSE

3. (Circle True or False): My bet will never be revealed to the other participants by the facilitator.

TRUE FALSE

4. (Circle True or False): Neither the facilitator nor any experiment participant has the ability to communicate with another participant without the group's knowledge using the GSS or headset telephone systems.

TRUE FALSE

5. (Circle True or False): The meeting facilitator is not an experimental subject, but an unbiased experiment administrator.

TRUE FALSE

Appendix C: Sport of Kings

Experimental Treatment 2 Handout

Sport of Kings Experiment

Introduction

This experiment is being conducted to collect data on users' assessment of a computer meeting system called a Group Support System, or GSS for short. GSS is a combination of networked computers and a human facilitator which allows groups of decision makers to work together in a virtual environment. Today you'll use GSS to work through the problem of identifying the three top finishers from a field of nine horses running in a fictional race called the Cooper Stakes. At the end of the experiment, each of you will bet individually on the horses you think will finish first, second, and third in the race, in exact order. This type of bet is called a *trifecta*.

Your bet will not be revealed to the other experiment participants.

Task Description

Chance and ability are not factors in the Cooper Stakes. Instead, race results have been predetermined and are known only to the facilitator. The horse whose racing preferences best match the conditions on race day will win the race. At each GSS workstation is a participant-specific racing form/worksheet that contains information about race conditions and preferences of the horses running in the race. During this experiment you'll have the opportunity to exchange information with the other experiment participants in order to build a better profile of each of the horses and make a more informed decision when it comes time to place your bet on the *trifecta*.

Your racing form contains some information shared by other experiment participants, and some known only to you. Your worksheet makes no distinction between the two. Trial-and-error will be your only means of determining if a piece of information is held by some other participant or is known to you alone.

The experiment has one other slight catch. Horse racing employs a betting scheme called *pari-mutuel* betting to determine odds on horses and payoffs for winning bets. According to this scheme, the higher the amount bet on a *trifecta*, the lower the odds on a bet and the lower the payoff to bettors if the *trifecta* hits.

The developer of the GSS is very interested in seeing the system perform well. For this reason he has entrusted the facilitator with an undisclosed sum to pay off winning bets. If the entire group manages to identify the winning *trifecta*, each participant will be paid $7.00 for his or her efforts, plus a bonus to be disclosed at the end of the experiment. In any other combination, however, individuals will be paid $9.00 for a correct bet. Participants who fail to identify the winning trifecta will receive no money for their efforts. This information is summarized in the table below.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Experimental Design

There are three participants in this experiment. Your name (Participant A, B, or C) will be prominently posted on your computer station.

The meeting facilitator is not an experimental subject, but experiment administrator. As such, this individual controls the GDSS system, the distribution of instructions and information to experiment participants, participant activities, and the distribution of cash payments at the end of the session.

In face-to-face meetings, the facilitator can align with a meeting participant and effectively influence a meeting's outcome. One of the primary purposes of this experiment is to find out if the GSS can mitigate the facilitator's ability to influence group actions and meeting outcomes. **Today, the facilitator will attempt to provide special help to Participant A in order to maximize his or her performance.** Participant A is encouraged to seek the aid of the facilitator.

The setup of the GSS system is described below, in Figure 1. All meeting participants, including the facilitator, are located in separate, isolated facilities, as described below.

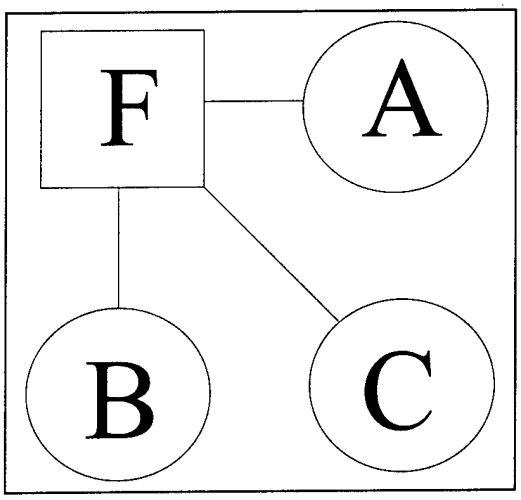


Figure 1. Physical Design of GDSS

All interaction and communication between participants A, B and C and facilitator will take form of broadcast messages transmitted over your telephone headset or the GSS. Neither the facilitator nor any experiment participant has the ability to communicate individually with another participant using these systems.

All comments submitted via the GSS will be marked with the contributor's name (Facilitator, Participant A, B, or C).

Continue to next page.

Choosing the Winners

Using the worksheet provided, you will match horses' preferences to the actual conditions of the race. If a horse's preference in a given category matches up to the respective condition on race day, you will award the horse a point for that category. For example, if Ruthless Ruthie likes racing on a muddy track and you determine that the track is muddy on the day of the race, you will award Ruthless Ruthie a point in the "Track Condition" category. See the example, below:

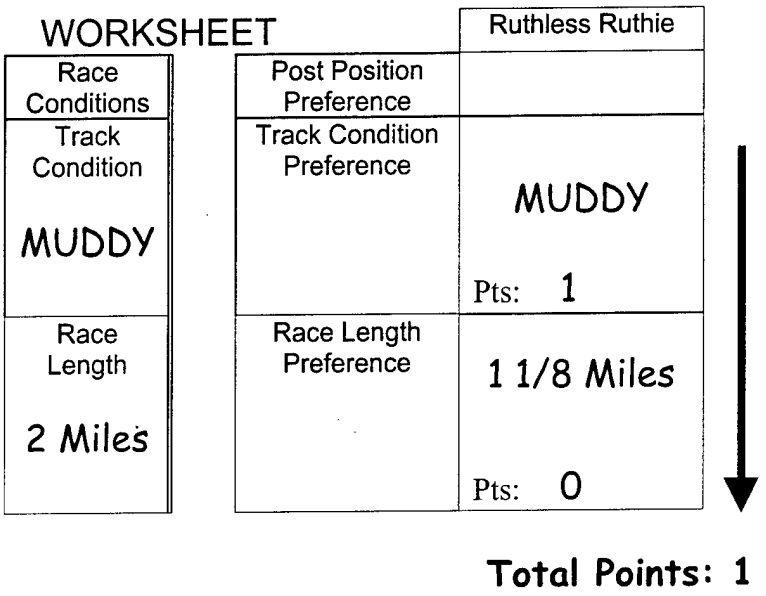
WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition **MUDDY**	Track Condition Preference	**MUDDY** Pts: **1**
Race Length	Race Length Preference	Pts:

If a horse's preference does not match up to the respective race condition, you will award the horse a score of zero for the respective category. For example, if you discover that Ruthless Ruthie likes running races which are 1 1/8 miles in length and you determine the Cooper Stakes is a 2 mile race, you will award her a score of zero in the "Race Length" category. See the example below:

WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition MUDDY	Track Condition Preference	MUDDY Pts: 1
Race Length **2 Miles**	Race Length Preference	**1 1/8 Miles** Pts: **0**

Continue to next page.

The race winner will be the horse whose preferences best match the 10 race conditions, that is, the horse with the highest score of 10 possible points. The second-place horse will have the second highest total of 10 possible points; the third-place finisher will have the third-highest total of 10 possible points. In our example (see below), Ruthless Ruthie has scored one out of two possible points.



Agenda

1. Participants read introductory materials.

2. Participants complete comprehension exercise at their workstations.

3. The facilitator describes task and demonstrates system operation to participants.

4. The facilitator enables GSS, allowing participants 40 minutes to discuss the experimental task as a group. The facilitator will monitor time and inform participants when 35, 30, 25, 20, 15, 10, 8, 5, 3, and 1 minute remain.

5. The facilitator allows participants 10 minutes to review comments submitted to the group.

6. Participants individually place bets on the race by completing the betting form provided. There is no time limit for this part of the experiment.

7. Participants complete a survey asking them about their interaction with other group members using GSS, their opinion of the usefulness of the system, and their satisfaction with the job done by the meeting facilitator. There is no time limit for this part of the experiment.

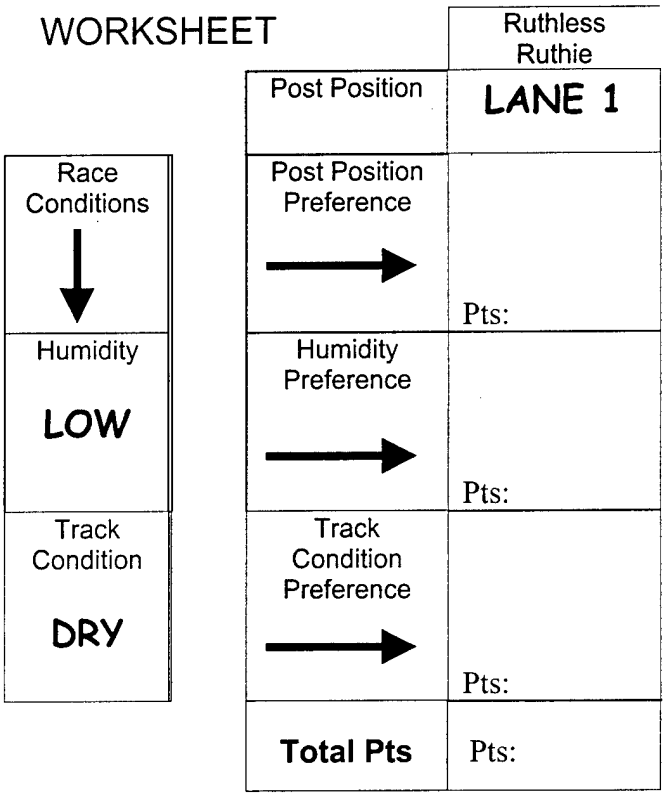
8. Facilitator collects experiment materials from participants and briefs each individually on the results and purpose of the experiment.

Exercise
Sport of Kings

Instructions: Working through the following exercise will sharpen the skills and understanding you will need to successfully perform Sport of Kings experimental tasks. Please answer all of the questions below. Feel free to ask the facilitator for help and/or clarification at any time. There is no time limit for this task.

1. Read the following paragraph and transcribe the information it contains to the worksheet. Use the worksheet to answer the question below. Circle the best answer.

Ruthless Ruthie - Runs best on a dry track. Prefers high humidity. Prefers running from Lane 1.



Q1 (Circle Best Answer): How many points should you award Ruthless Ruthie based on the information above?

A. 0 B. 1 C. 2 D. 3

Please Complete Questions 2 - 5, Next Page.

2. Use the chart below to answer Question 2.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + Bonus	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $ 9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Q2 (Circle True or False): If Participant A is the only participant to correctly identify the winning *trifecta* for the Cooper Stakes, he or she will be paid $ 9.00 at the end of the experiment and Participants B and C will receive no money for participating in the experiment.

TRUE FALSE

3. (Circle True or False): My bet will never be revealed to the other participants by the facilitator.

TRUE FALSE

4. (Circle True or False): Neither the facilitator nor any experiment participant has the ability to communicate individually with another participant using these GSS or headset telephone systems.

TRUE FALSE

5. (Circle True or False): The facilitator will attempt to provide special help to Participant A in order to maximize his or her performance.

TRUE FALSE

Appendix D: Sport of Kings

Experimental Treatment 3 Handout

Sport of Kings Experiment

Introduction

This experiment is being conducted to collect data on users' assessment of a computer meeting system called a Group Support System, or GSS for short. GSS is a combination of networked computers and a human facilitator which allows groups of decision makers to work together in a virtual environment. Today you'll use GSS to work through the problem of identifying the three top finishers from a field of nine horses running in a fictional race called the Cooper Stakes. At the end of the experiment, each of you will bet individually on the horses you think will finish first, second, and third in the race, in exact order. This type of bet is called a *trifecta*.

Your bet will not be revealed to the other experiment participants.

Task Description

Chance and ability are not factors in the Cooper Stakes. Instead, race results have been predetermined and are known only to the facilitator. The horse whose racing preferences best match the conditions on race day will win the race. At each GSS workstation is a participant-specific racing form/worksheet that contains information about race conditions and preferences of the horses running in the race. During this experiment you'll have the opportunity to exchange information with the other experiment participants in order to build a better profile of each of the horses and make a more informed decision when it comes time to place your bet on the *trifecta*.

Your racing form contains some information shared by other experiment participants, and some known only to you. Your worksheet makes no distinction between the two. Trial-and-error will be your only means of determining if a piece of information is held by some other participant or is known to you alone.

The experiment has one other slight catch. Horse racing employs a betting scheme called *pari-mutuel* betting to determine odds on horses and payoffs for winning bets. According to this scheme, the higher the amount bet on a *trifecta*, the lower the odds on a bet and the lower the payoff to bettors if the *trifecta* hits.

The developer of the GSS is very interested in seeing the system perform well. For this reason he has entrusted the facilitator with an undisclosed sum to pay off winning bets. If the entire group manages to identify the winning *trifecta*, each participant will be paid $7.00 for his or her efforts, plus a bonus to be disclosed at the end of the experiment. In any other combination, however, individuals will be paid $9.00 for a correct bet. Participants who fail to identify the winning trifecta will receive no money for their efforts. This information is summarized in the table below.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Experimental Design

There are three participants in this experiment. Your name (Participant A, B, or C) will be prominently posted on your computer station.

The meeting facilitator, is not an experimental subject, but an unbiased experiment administrator. As such, this individual controls the GDSS system, the distribution of instructions and information to experiment participants, participant activities, and the distribution of cash payments at the end of the session.

The setup of the GSS system is described below, in Figure 1. You can see from the picture that Participants B and C are located in separate, isolated facilities and that Participant A is co-located with the facilitator.

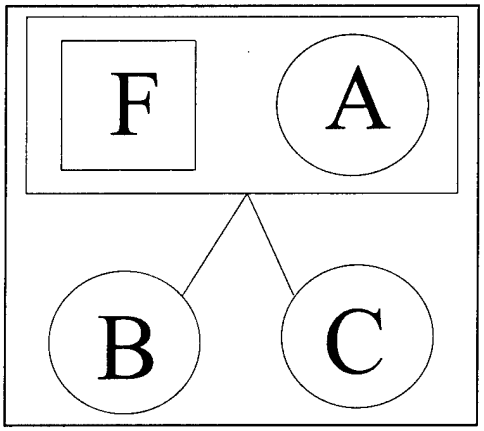


Figure 1. Physical Design of GDSS

All interaction and communication between participants B and C and facilitator will take form of broadcast messages transmitted over your telephone headset or the GDSS. Neither the facilitator nor any experiment participant has the ability to communicate individually with another individual using these systems.

All comments submitted via the GSS will be marked with the contributor's name (Facilitator, Participant A, B, or C).

Participant A and the facilitator because they are sharing a room, will of course be able to communicate outside of the system without the knowledge of Participants B and C.

Continue to next page.

Choosing the Winners

Using the worksheet provided, you will match horses' preferences to the actual conditions of the race. If a horse's preference in a given category matches up to the respective condition on race day, you will award the horse a point for that category. For example, if Ruthless Ruthie likes racing on a muddy track and you determine that the track is muddy on the day of the race, you will award Ruthless Ruthie a point in the "Track Condition" category. See the example, below:

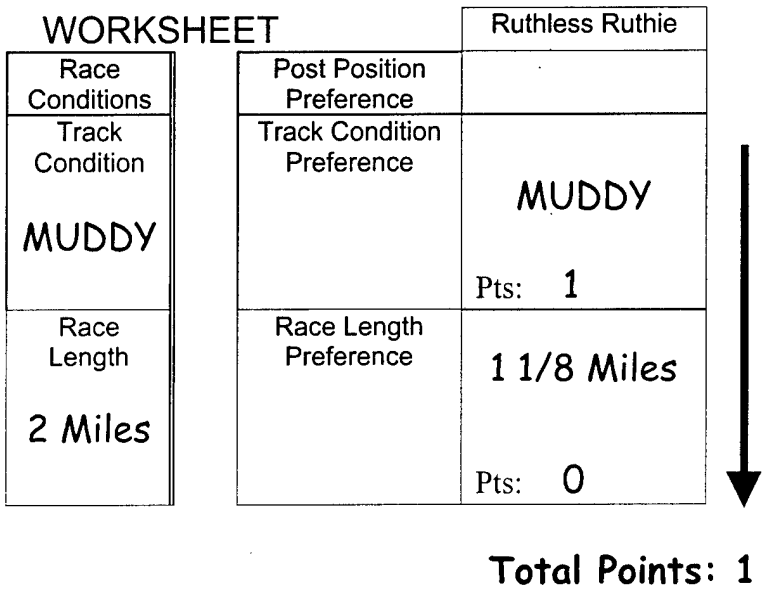
WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition **MUDDY**	Track Condition Preference	**MUDDY** Pts: **1**
Race Length	Race Length Preference	Pts:

If a horse's preference does not match up to the respective race condition, you will award the horse a score of zero for the respective category. For example, if you discover that Ruthless Ruthie likes running races which are 1 1/8 miles in length and you determine the Cooper Stakes is a 2 mile race, you will award her a score of zero in the "Race Length" category. See the example below:

WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition MUDDY	Track Condition Preference	MUDDY Pts: **1**
Race Length **2 Miles**	Race Length Preference	**1 1/8 Miles** Pts: **0**

Continue to next page.

The race winner will be the horse whose preferences best match the 10 race conditions, that is, the horse with the highest score of 10 possible points. The second-place horse will have the second highest total of 10 possible points; the third-place finisher will have the third-highest total of 10 possible points. In our example (see below), Ruthless Ruthie has scored one out of two possible points.



Agenda

1. Participants read introductory materials.

2. Participants complete comprehension exercise at their workstations.

3. The facilitator describes task and demonstrates system operation to participants.

4. The facilitator enables GDSS, allowing participants 40 minutes to discuss the experimental task as a group. The facilitator will monitor time and inform participants when 35, 30, 25, 20, 15, 10, 8, 5, 3, and 1 minute remain.

5. The facilitator allows participants 10 minutes to review comments submitted to the group.

6. Participants individually place bets on the race by completing the betting form provided. There is no time limit for this part of the experiment.

7. Participants complete a survey asking them about their interaction with other group members using GDSS, their opinion of the usefulness of the system, and their satisfaction with the job done by the meeting facilitator. There is no time limit for this part of the experiment.

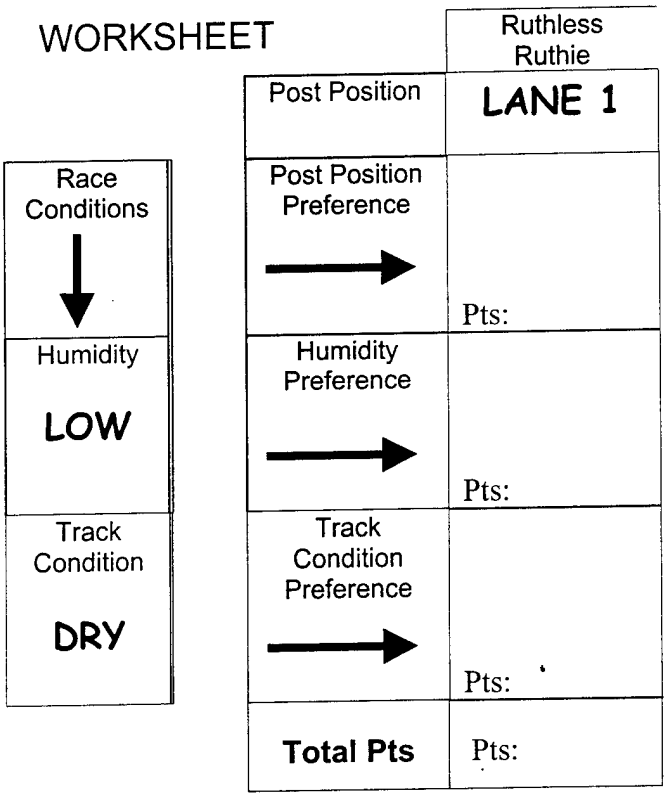
8. Facilitator collects experiment materials from participants and briefs each individually on the results and purpose of the experiment.

Exercise
Sport of Kings

Instructions: Working through the following exercise will sharpen the skills and understanding you will need to successfully perform Sport of Kings experimental tasks. Please answer all of the questions below. Feel free to ask the facilitator for help and/or clarification at any time. There is no time limit for this task..

1. Read the following paragraph and transcribe the information it contains to the worksheet. Use the worksheet to answer the question below. Circle the best answer.

Ruthless Ruthie - Runs best on a dry track. Prefers high humidity. Prefers running from Lane 1.



Q1 (Circle Best Answer): How many points should you award Ruthless Ruthie based on the information above?

A. 0 B. 1 C. 2 D. 3

Please Complete Questions 2 - 5, Next Page.

2. Use the chart below to answer Question 2.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $ 9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Q2 (Circle True or False): If Participant A is the only participant to correctly identify the winning *trifecta* for the Cooper Stakes, he or she will be paid $ 9.00 at the end of the experiment and Participants B and C will receive no money for participating in the experiment.

TRUE FALSE

3. (Circle True or False): My bet will never be revealed to the other participants by the Facilitator.

TRUE FALSE

4. (Circle True or False): The facilitator will be able to speak privately with Participant A during the experiment without Participant B and C's knowledge.

TRUE FALSE

5. (Circle True or False): The meeting facilitator is not an experimental subject, but an unbiased experiment administrator.

TRUE FALSE

Appendix E: Sport of Kings

Experimental Treatment 4 Handout

Sport of Kings Experiment

Introduction

This experiment is being conducted to collect data on users' assessment of a computer meeting system called a Group Support System, or GSS for short. GSS is a combination of networked computers and a human facilitator which allows groups of decision makers to work together in a virtual environment. Today you'll use GSS to work through the problem of identifying the three top finishers from a field of nine horses running in a fictional race called the Cooper Stakes. At the end of the experiment, each of you will bet individually on the horses you think will finish first, second, and third in the race, in exact order. This type of bet is called a *trifecta*.

Your bet will not be revealed to the other experiment participants.

Task Description

Chance and ability are not factors in the Cooper Stakes. Instead, race results have been predetermined and are known only to the facilitator. The horse whose racing preferences best match the conditions on race day will win the race. At each GSS workstation is a participant-specific racing form/worksheet that contains information about race conditions and preferences of the horses running in the race. During this experiment you'll have the opportunity to exchange information with the other experiment participants in order to build a better profile of each of the horses and make a more informed decision when it comes time to place your bet on the *trifecta*.

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The experiment has one other slight catch. Horse racing employs a betting scheme called *pari-mutuel* betting to determine odds on horses and payoffs for winning bets. According to this scheme, the higher the amount bet on a *trifecta*, the lower the odds on a bet and the lower the payoff to bettors if the *trifecta* hits.

The developer of the GSS is very interested in seeing the system perform well. For this reason he has entrusted the facilitator with an undisclosed sum to pay off winning bets. If the entire group manages to identify the winning *trifecta*, each participant will be paid $7.00 for his or her efforts, plus a bonus to be disclosed at the end of the experiment. In any other combination, however, individuals will be paid $9.00 for a correct bet. Participants who fail to identify the winning trifecta will receive no money for their efforts. This information is summarized in the table below.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Experimental Design

There are three participants in this experiment. Your name (Participant A, B, or C) will be prominently posted on your computer station.

The meeting facilitator is not an experimental subject, but experiment administrator. As such, this individual controls the GSS system, the distribution of instructions and information to experiment participants, participant activities, and the distribution of cash payments at the end of the session.

In face-to-face meetings, the facilitator can align with a meeting participant and effectively influence a meeting's outcome. One of the primary purposes of this experiment is to find out if the GSS can mitigate the facilitator's ability to influence group actions and meeting outcomes. **Today, the facilitator will attempt to provide special help to Participant A in order to maximize his or her performance.** Participant A is encouraged to seek the aid of the facilitator.

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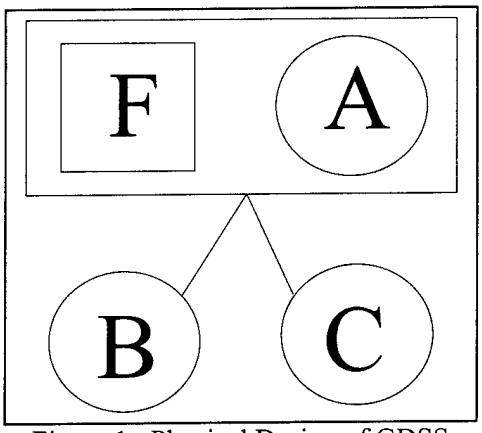

Figure 1. Physical Design of GDSS

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Choosing the Winners

Using the worksheet provided, you will match horses' preferences to the actual conditions of the race. If a horse's preference in a given category matches up to the respective condition on race day, you will award the horse a point for that category. For example, if Ruthless Ruthie likes racing on a muddy track and you determine that the track is muddy on the day of the race, you will award Ruthless Ruthie a point in the "Track Condition" category. See the example, below:

WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
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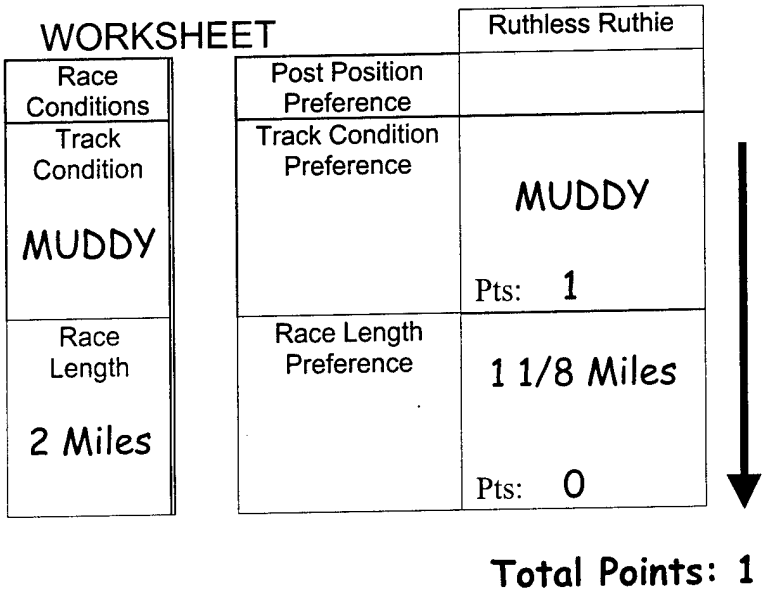
If a horse's preference does not match up to the respective race condition, you will award the horse a score of zero for the respective category. For example, if you discover that Ruthless Ruthie likes running races which are 1 1/8 miles in length and you determine the Cooper Stakes is a 2 mile race, you will award her a score of zero in the "Race Length" category. See the example below:

WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition **MUDDY**	Track Condition Preference	**MUDDY** Pts: **1**
Race Length **2 Miles**	Race Length Preference	**1 1/8 Miles** Pts: **0**

Continue to next page.

The race winner will be the horse whose preferences best match the 10 race conditions, that is, the horse with the highest score of 10 possible points. The second-place horse will have the second highest total of 10 possible points; the third-place finisher will have the third-highest total of 10 possible points. In our example (see below), Ruthless Ruthie has scored one out of two possible points.



Agenda

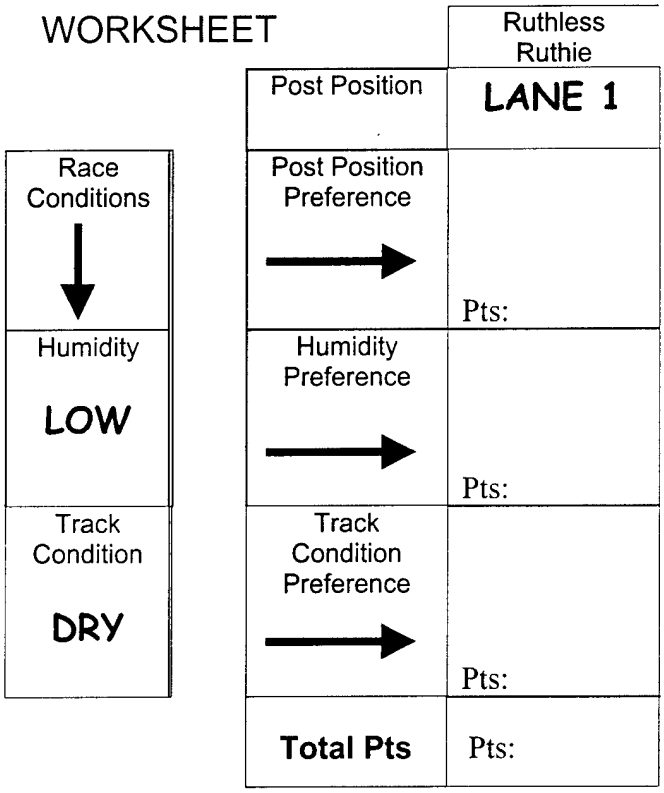
1. Participants read introductory materials.
2. Participants complete comprehension exercise at their workstations.
3. The facilitator describes task and demonstrates system operation to participants.
4. The facilitator enables GDSS, allowing participants 40 minutes to discuss the experimental task as a group. The facilitator will monitor time and inform participants when 35, 30, 25, 20, 15, 10, 8, 5, 3, and 1 minute remain.
5. The facilitator allows participants 10 minutes to review comments submitted to the group.
6. Participants individually place bets on the race by completing the betting form provided. There is no time limit for this part of the experiment.
7. Participants complete a survey asking them about their interaction with other group members using GDSS, their opinion of the usefulness of the system, and their satisfaction with the job done by the meeting facilitator. There is no time limit for this part of the experiment.
8. Facilitator collects experiment materials from participants and briefs each individually on the results and purpose of the experiment.

Exercise
Sport of Kings

Instructions: Working through the following exercise will sharpen the skills and understanding you will need to successfully perform Sport of Kings experimental tasks. Please answer all of the questions below. Feel free to ask the facilitator for help and/or clarification at any time. There is no time limit for this task..

1. Read the following paragraph and transcribe the information it contains to the worksheet. Use the worksheet to answer the question below. Circle the best answer.

Ruthless Ruthie - Runs best on a dry track. Prefers high humidity. Prefers running from Lane 1.



Q1 (Circle Best Answer): How many points should you award Ruthless Ruthie based on the information above?

A. 0 B. 1 C. 2 D. 3

Please Complete Questions 2 - 5, Next Page.

2. Use the chart below to answer Question 2.

	Total Earnings	
Number Of Correct Bets	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $ 9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Q2 (Circle True or False): If Participant A is the only participant to correctly identify the winning *trifecta* for the Cooper Stakes, he or she will be paid $9.00 at the end of the experiment and Participants B and C will receive no money for participating in the experiment.

TRUE FALSE

3. (Circle True or False): My bet will never be revealed to the other participants by the Facilitator.

TRUE FALSE

4. (Circle True or False): The facilitator will be able to speak privately with Participant A during the experiment without Participant B and C's knowledge.

TRUE FALSE

5. (Circle True or False): The facilitator will attempt to provide special help to Participant A in order to maximize his or her performance.

TRUE FALSE

Appendix F: Sport of Kings

Experimental Treatment 5 Handout

Sport of Kings Experiment

Introduction

This experiment is being conducted to collect data on users' assessment of a computer meeting system called a Group Support System or GSS for short. GSS is a combination of networked computers and a human facilitator that allows groups of decision makers to work together in a virtual environment. Today you'll use GSS to work through the problem of identifying the three top finishers from a field of nine horses running in a fictional race called the Cooper Stakes. At the end of the experiment, each of you will bet individually on the horses you think will finish first, second, and third in the race, in exact order. This type of bet is called a *trifecta*.

Your bet will not be revealed to the other experiment participants.

Task Description

Chance and ability are not factors in the Cooper Stakes. Instead, race results have been predetermined and are known only to the facilitator. The horse whose racing preferences best match the conditions on race day will win the race. At each GSS workstation is a participant-specific racing form that contains information about race conditions and preferences of the horses running in the race. During this experiment you'll have the opportunity to exchange information with the other experiment participants in order to build a better profile of each of the horses and make a more informed decision when it comes time to place your bet on the *trifecta*.

Your racing form contains some information shared by other experiment participants, and some known only to you. Your worksheet makes no distinction between the two. Trial-and-error will be your only means of determining if a piece of information is held by some other participant or is known to you alone.

The experiment has one other slight catch. Horse racing employs a betting scheme called *pari-mutuel* betting to determine odds on horses and payoffs for winning bets. According to this scheme, the higher the amount bet on a *trifecta*, the lower the odds on a bet and the lower the payoff to bettors if the *trifecta* hits.

The developer of the GSS is very interested in seeing the system perform well. For this reason he has entrusted the facilitator with an undisclosed sum to pay off winning bets. If the entire group manages to identify the winning *trifecta*, each participant will be paid $7.00 for his or her efforts, plus a bonus to be disclosed at the end of the experiment. In any other combination, however, individuals will be paid $9.00 for a correct bet. Participants who fail to identify the winning trifecta will receive no money for their efforts. This information is summarized in the table below.

	Total Earnings	
Number Of Correct Bettors	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Continue to next page.

Experimental Design

There are three participants in this experiment. Your name (Participant A, B, or C) will be prominently posted on your computer station.

The meeting facilitator is not an experimental subject, but experiment administrator. As such, this individual controls the GSS, the distribution of instructions and information to experiment participants, participant activities, and the distribution of cash payments at the end of the session.

In face-to-face meetings, the facilitator can align with a meeting participant and effectively influence a meeting's outcome. One of the primary purposes of this experiment is to find out if the GSS can mitigate the facilitator's ability to influence group actions and meeting outcomes. **Today, the facilitator will attempt to provide special help to Participant A in order to maximize his or her performance.** Participant A is encouraged to seek the aid of the facilitator.

The setup of the GSS is described below, in Figure 1. All meeting participants, including the facilitator, are located in separate, isolated facilities, as described, below.

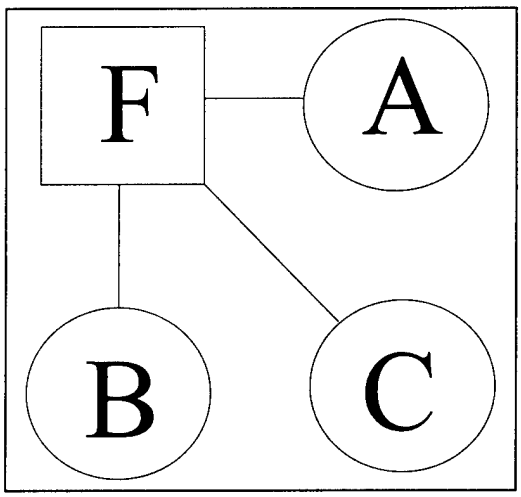


Figure 1. Physical Design of GSS

Interaction and communication between participants A, B and C and facilitator will take form of broadcast messages transmitted over your telephone headset or the GSS. Neither the facilitator nor any experiment participant has the ability to communicate individually with another participant using the telephone headset or the GSS.

All comments submitted via the GSS will be marked with the contributor's name (Facilitator, Participant A, B, or C).

Continue to next page.

Choosing the Winners

Using the worksheet provided, you will match horses' preferences to the actual conditions of the race. If a horse's preference in a given category matches up to the respective condition on race day, you will award the horse a point for that category. For example, if Ruthless Ruthie likes racing on a muddy track and you determine that the track is muddy on the day of the race, you will award Ruthless Ruthie a point in the "Track Condition" category. See the example, below:

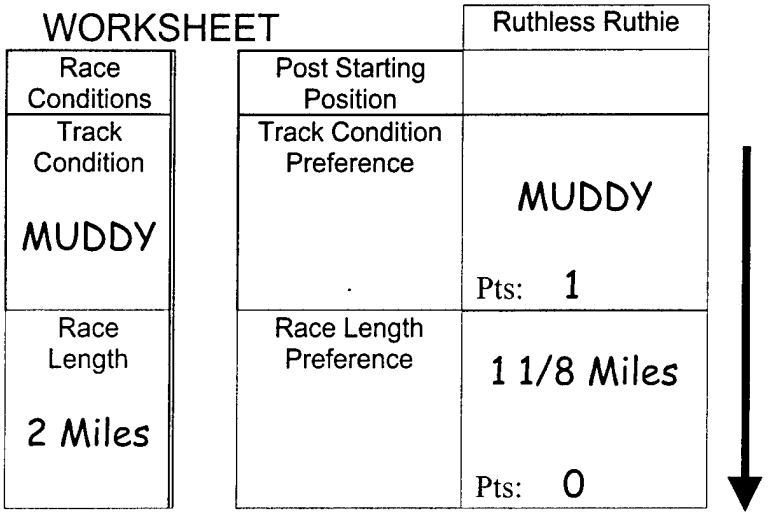
WORKSHEET		Ruthless Ruthie
Race Conditions	Post Starting Position	
Track Condition **MUDDY**	Track Condition Preference	**MUDDY** Pts: **1**
Race Length	Race Length Preference	Pts:

If a horse's preference does not match up to the respective race condition, you will award the horse a score of zero for the respective category. For example, if you discover that Ruthless Ruthie likes running races which are 1 1/8 miles in length and you determine the Cooper Stakes is a 2 mile race, you will award her a score of zero in the "Race Length" category. See the example below:

WORKSHEET		Ruthless Ruthie
Race Conditions	Post Position Preference	
Track Condition MUDDY	Track Condition Preference	MUDDY Pts: **1**
Race Length **2 Miles**	Race Length Preference	**1 1/8 Miles** Pts: **0**

Continue to next page.

The race winner will be the horse whose preferences best match the 10 race conditions, that is, the horse with the highest score of 10 possible points. The second-place horse will have the second highest total of 10 possible points; the third-place finisher will have the third-highest total of 10 possible points. In our example (see below), Ruthless Ruthie has scored one out of two possible points.



Total Points: 1

Agenda

1. Participants read introductory materials.

2. Participants complete comprehension exercise at their workstations.

3. The facilitator describes task and demonstrates system operation to participants.

4. The facilitator enables GSS, allowing participants 40 minutes to discuss the experimental task as a group. The facilitator will monitor time and inform participants when 35, 30, 25, 20, 15, 10, 8, 5, 3, and 1 minute remain.

5. The facilitator allows participants 10 minutes to review comments submitted to the group.

6. Participants individually place bets on the race by completing the betting form provided. There is no time limit for this part of the experiment.

7. Participants complete a survey asking them about their interaction with other group members using GSS, their opinion of the usefulness of the system, and their satisfaction with the job done by the meeting facilitator. There is no time limit for this part of the experiment.

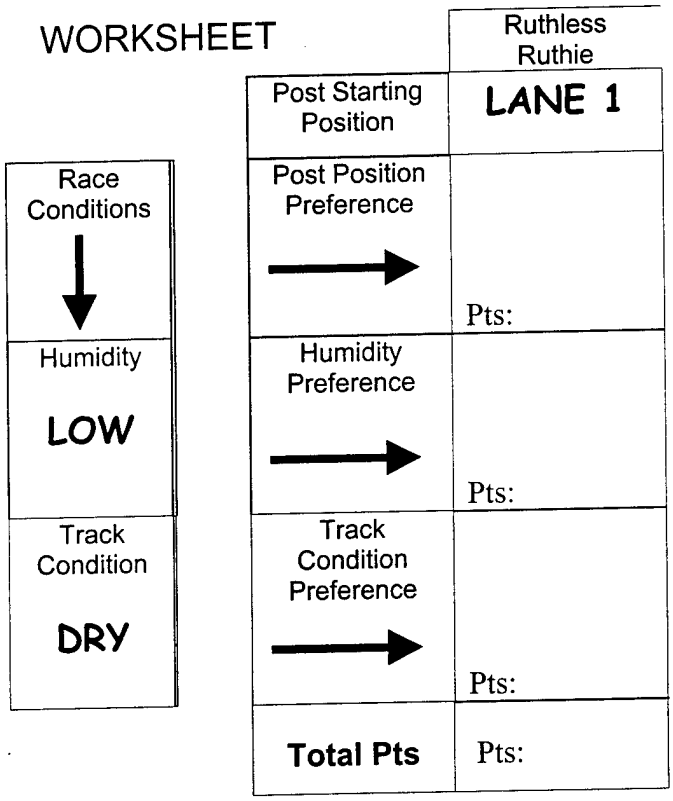
8. Facilitator collects experiment materials from participants and briefs each individually on the results and purpose of the experiment.

Exercise
Sport of Kings

Instructions: Working through the following exercise will sharpen the skills and understanding you will need to successfully perform Sport of Kings experimental tasks. Please answer all of the questions below. Feel free to ask the facilitator for help and/or clarification at any time. There is no time limit for this task.

1. Read the following paragraph and transcribe the information it contains to the worksheet. Use the worksheet to answer the question below. Circle the best answer.

Ruthless Ruthie - **Runs best on a dry track. Prefers high humidity. Prefers running from Lane 1.**



Q1 (Circle Best Answer): How many points should you award Ruthless Ruthie based on the information above?

A. 0 B. 1 C. 2 D. 3

Please Complete Questions 2 - 5, Next Page.

2. Use the chart below to answer Question 2.

	Total Earnings	
Number Of Correct Bettors	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + Bonus	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $ 9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Q2 (Circle True or False): If Participant A is the only participant to correctly identify the winning *trifecta* for the Cooper Stakes, he or she will be paid $ 9.00 at the end of the experiment and Participants B and C will receive no money for participating in the experiment.

TRUE FALSE

3. (Circle True or False): My bet will never be revealed to the other participants by the Facilitator.

TRUE FALSE

4. (Circle True or False): Neither the facilitator nor any experiment participant has the ability to communicate individually with another participant using these GSS or headset telephone systems.

TRUE FALSE

5. (Circle True or False): The facilitator will attempt to provide special help to Participant A in order to maximize his or her performance.

TRUE FALSE

Stop.

Appendix G: Sport of Kings

Experimental Treatment 6 Handout

Sport of Kings Experiment

Introduction

This experiment is being conducted to collect data on users' assessment of a computer meeting system called a Group Support System or GSS for short. GSS is a combination of networked computers and a human facilitator that allows groups of decision makers to work together in a virtual environment. Today you'll use GSS to work through the problem of identifying the three top finishers from a field of nine horses running in a fictional race called the Cooper Stakes. At the end of the experiment, each of you will bet individually on the horses you think will finish first, second, and third in the race, in exact order. This type of bet is called a *trifecta*.

Your bet will not be revealed to the other experiment participants.

Task Description

Chance and ability are not factors in the Cooper Stakes. Instead, race results have been predetermined and are known only to the facilitator. The horse whose racing preferences best match the conditions on race day will win the race. At each GSS workstation is a participant-specific racing form that contains information about race conditions and preferences of the horses running in the race. During this experiment you'll have the opportunity to exchange information with the other experiment participants in order to build a better profile of each of the horses and make a more informed decision when it comes time to place your bet on the *trifecta*.

Your racing form contains some information shared by other experiment participants, and some known only to you. Your worksheet makes no distinction between the two. Trial-and-error will be your only means of determining if a piece of information is held by some other participant or is known to you alone.

The experiment has one other slight catch. Horse racing employs a betting scheme called *pari-mutuel* betting to determine odds on horses and payoffs for winning bets. According to this scheme, the higher the amount bet on a *trifecta*, the lower the odds on a bet and the lower the payoff to bettors if the *trifecta* hits.

The developer of the GSS is very interested in seeing the system perform well. For this reason he has entrusted the facilitator with an undisclosed sum to pay off winning bets. If the entire group manages to identify the winning *trifecta*, each participant will be paid $7.00 for his or her efforts, plus a bonus to be disclosed at the end of the experiment. In any other combination, however, individuals will be paid $9.00 for a correct bet. Participants who fail to identify the winning trifecta will receive no money for their efforts. This information is summarized in the table below.

	Total Earnings	
Number Of Correct Bettors	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + BONUS	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Continue to next page.

Experimental Design

There are three participants in this experiment. Your name (Participant A, B, or C) will be prominently posted on your computer station.

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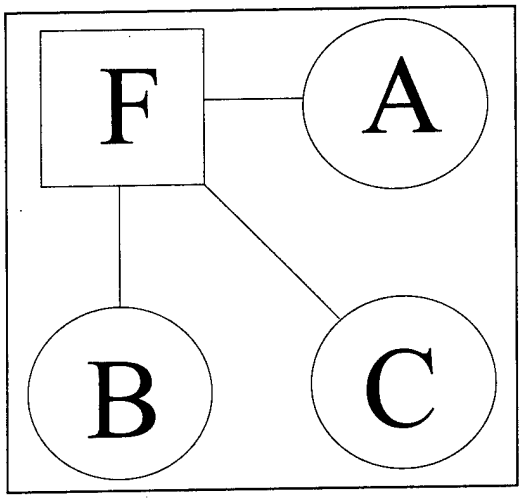

Figure 1. Physical Design of GSS

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Choosing the Winners

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WORKSHEET		Ruthless Ruthie
Race Conditions	Post Starting Position	
Track Condition **MUDDY**	Track Condition Preference	**MUDDY** Pts: **1**
Race Length **2 Miles**	Race Length Preference	**1 1/8 Miles** Pts: **0**

Continue to next page.

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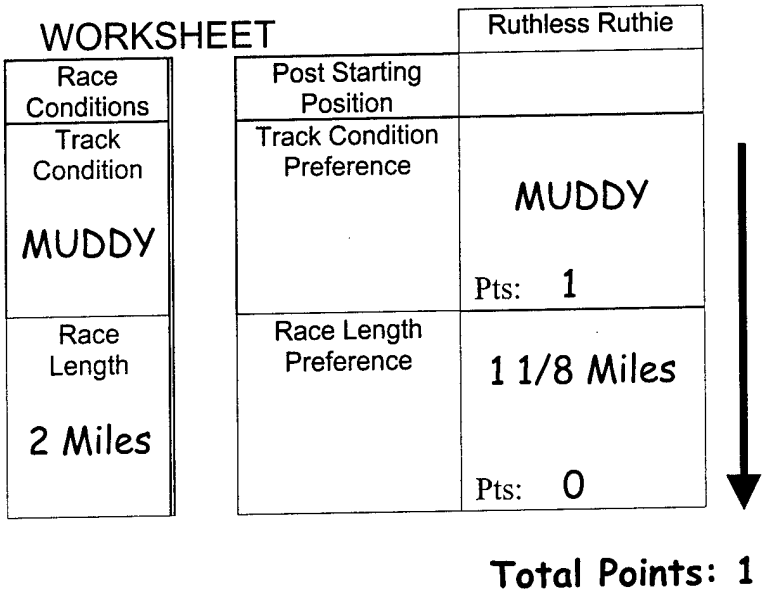


Agenda

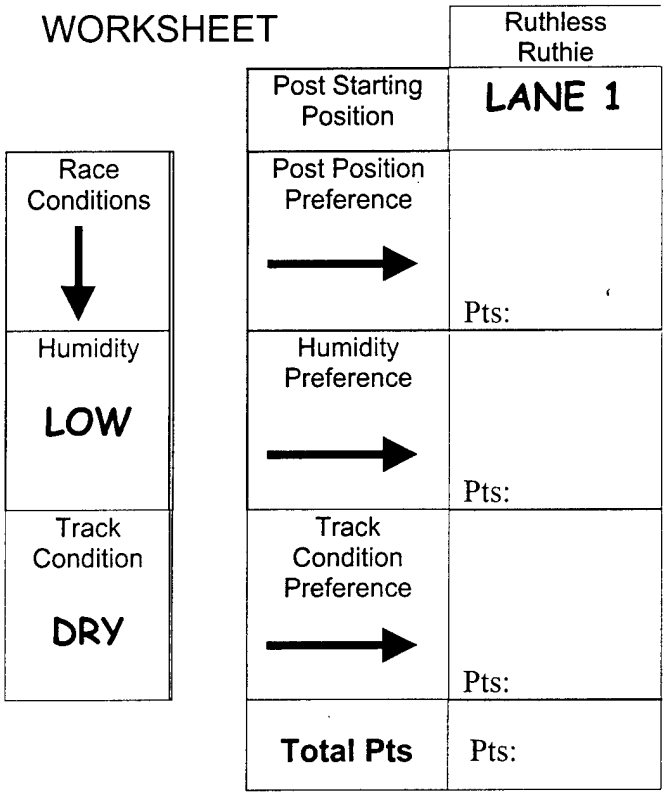
1. Participants read introductory materials.
2. Participants complete comprehension exercise at their workstations.
3. The facilitator describes task and demonstrates system operation to participants.
4. The facilitator enables GSS, allowing participants 40 minutes to discuss the experimental task as a group. The facilitator will monitor time and inform participants when 35, 30, 25, 20, 15, 10, 8, 5, 3, and 1 minute remain.
5. The facilitator allows participants 10 minutes to review comments submitted to the group.
6. Participants individually place bets on the race by completing the betting form provided. There is no time limit for this part of the experiment.
7. Participants complete a survey asking them about their interaction with other group members using GSS, their opinion of the usefulness of the system, and their satisfaction with the job done by the meeting facilitator. There is no time limit for this part of the experiment.
8. Facilitator collects experiment materials from participants and briefs each individually on the results and purpose of the experiment.

Exercise
Sport of Kings

Instructions: Working through the following exercise will sharpen the skills and understanding you will need to successfully perform Sport of Kings experimental tasks. Please answer all of the questions below. Feel free to ask the facilitator for help and/or clarification at any time. There is no time limit for this task.

1. Read the following paragraph and transcribe the information it contains to the worksheet. Use the worksheet to answer the question below. Circle the best answer.

Ruthless Ruthie - **Runs best on a dry track. Prefers high humidity. Prefers running from Lane 1.**



Q1 (Circle Best Answer): How many points should you award Ruthless Ruthie based on the information above?

A. 0 B. 1 C. 2 D. 3

Please Complete Questions 2 - 5, Next Page.

2. Use the chart below to answer Question 2.

	Total Earnings	
Number Of Correct Bettors	**Total earnings for Correct Bet**	**Total Earnings for Incorrect Bet**
3	(3) $7.00 + Bonus	(0) N/A
2	(2) $9.00	(1) $0.00
1	(1) $ 9.00	(2) $0.00
0	(0) N/A	(3) $0.00

Q2 (Circle True or False): If Participant A is the only participant to correctly identify the winning *trifecta* for the Cooper Stakes, he or she will be paid $ 9.00 at the end of the experiment and Participants B and C will receive no money for participating in the experiment.

TRUE FALSE

3. (Circle True or False): My bet will never be revealed to the other participants by the Facilitator.

TRUE FALSE

4. (Circle True or False): Neither the facilitator nor any experiment participant has the ability to communicate individually with another participant using the GSS or headset telephone systems.

TRUE FALSE

5. (Circle True or False): The facilitator will attempt to provide special help to Participant A in order to maximize his or her performance.

TRUE FALSE

Stop.

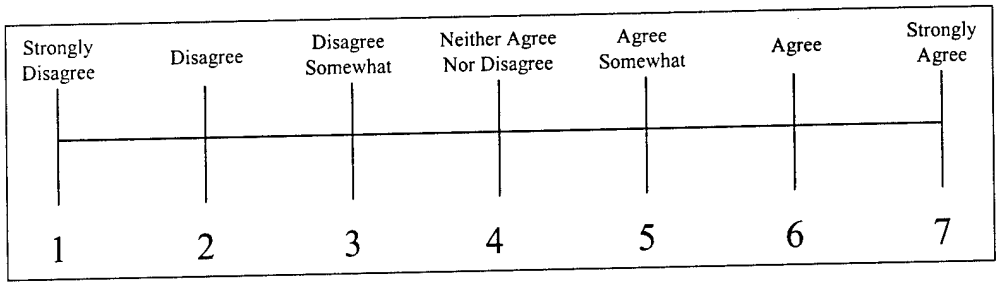
Appendix H: Sport of Kings Survey

Participant Identifier (A, B, or C) _____

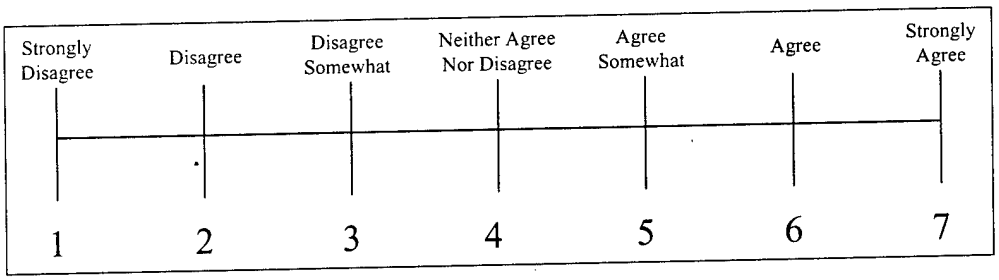
Survey

Please respond to the following statements using the scale provided with each statement. Circle only the number that best describes you reaction.

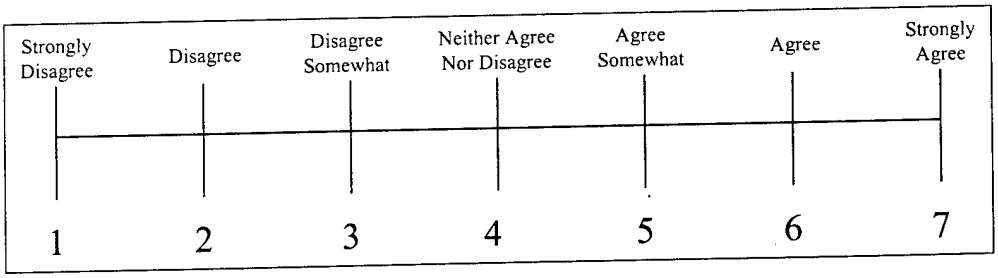
1. All experiment participants shared equal power to control meeting outcomes.



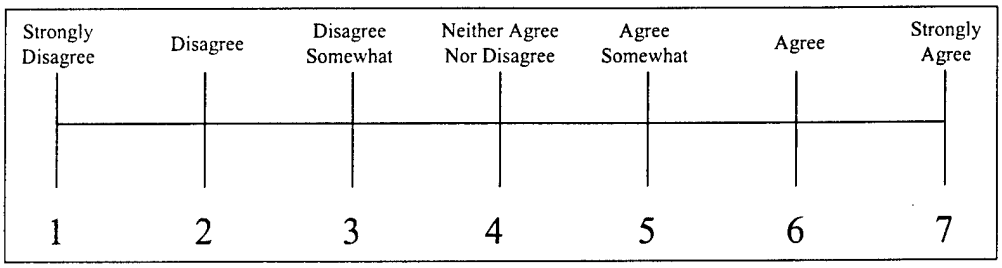
2. The setup of the GSS benefited all experiment participants equally.



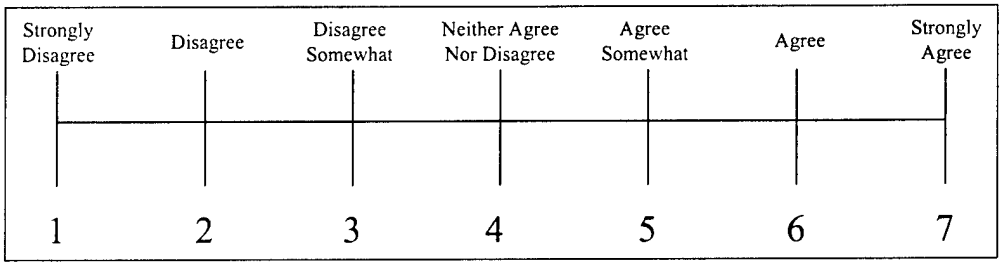
3. The GSS employed in the experiment was set up to benefit all participants equally.



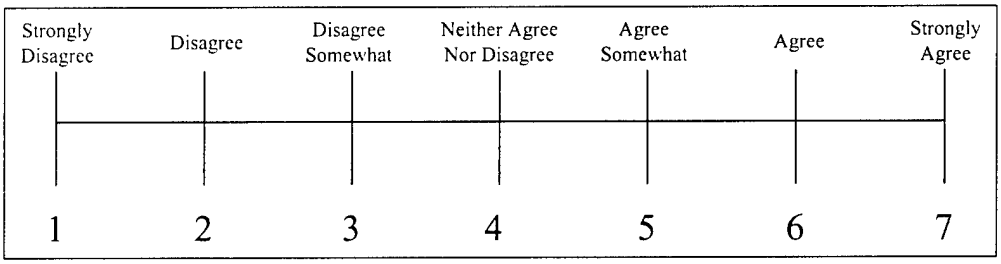
4. I feel the GDSS employed in the experiment helped focus the information exchange process.



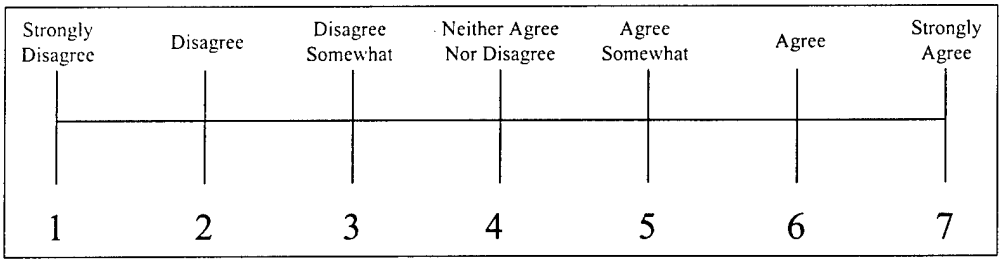
5. The facilitator did not provide special aid to any participant during the experiment.



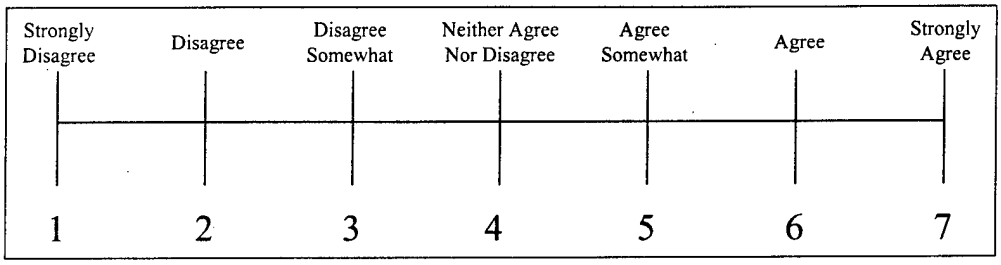
6. The facilitator had incentive to provide special aid to one experiment participant.



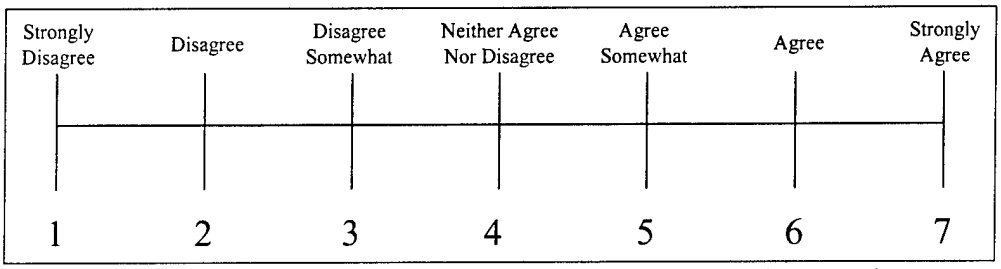
7. One of the experiment participants had the ability to communicate with the experiment facilitator outside of the GSS.



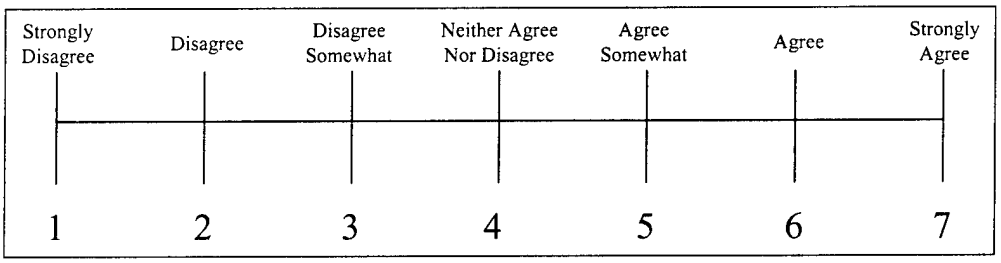
8. The facilitator helped all participants equally during the experiment.



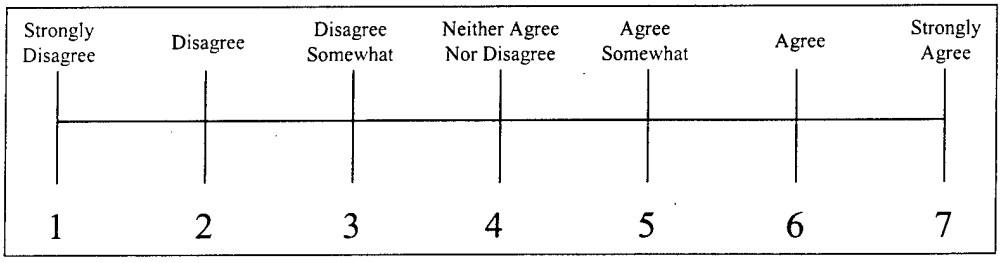
9. I am pleased with the performance of our group.



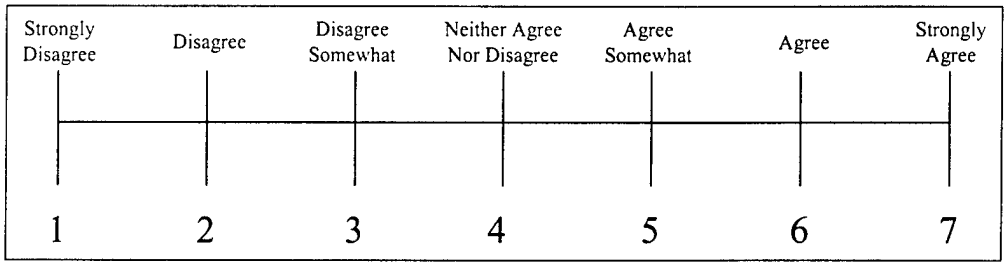
10. I am satisfied with the aid the facilitator provided ME during the experiment.



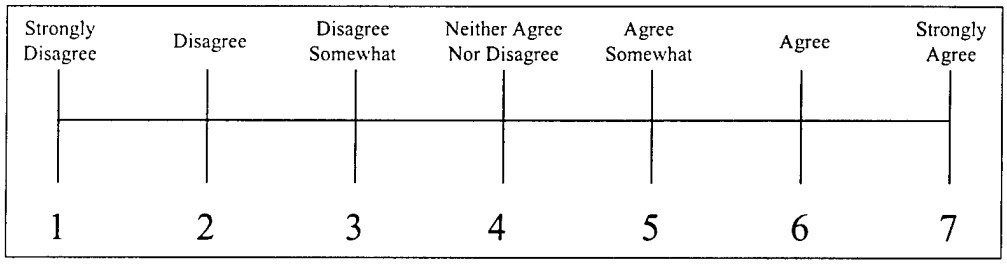
11. In my opinion, the facilitator performed his duties effectively.



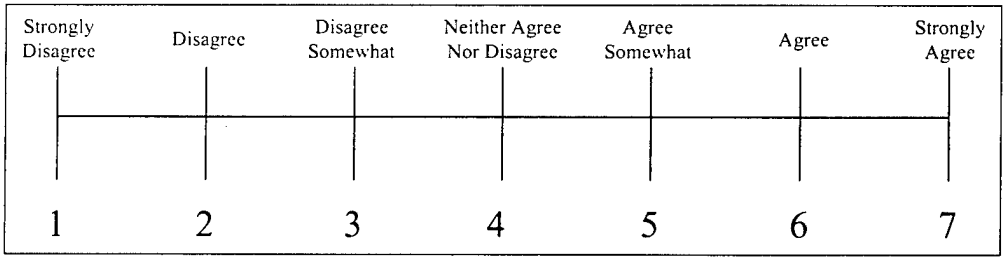
12. One of the experiment participants had better access to the facilitator than the other participants.



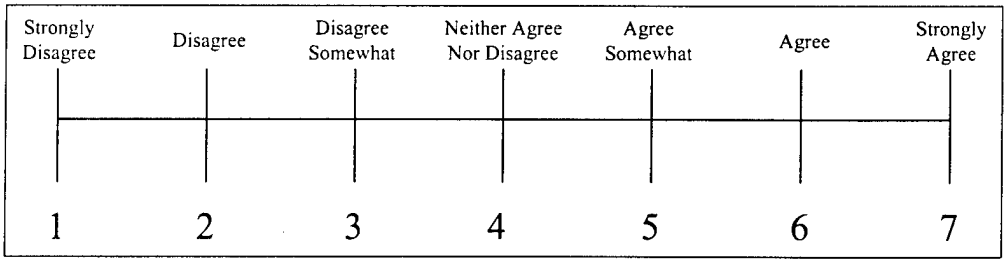
13. I feel the facilitator performed his duties in a satisfactory manner.



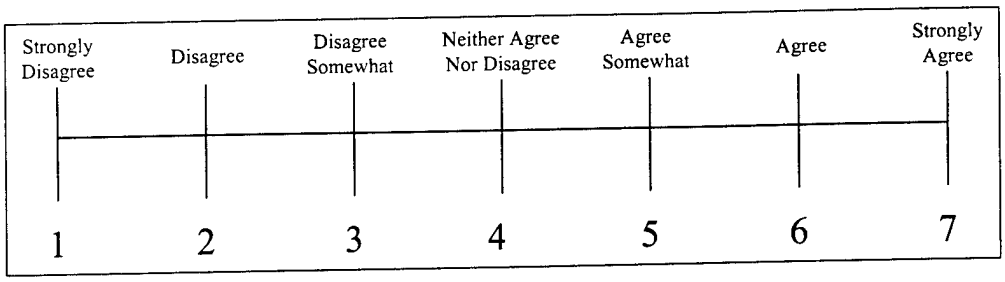
14. The facilitator was motivated to enhance the performance of one participant at the expense of the other participants.



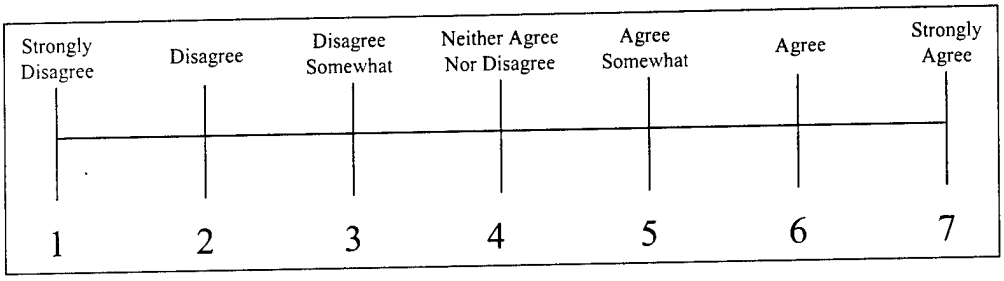
15. The setup of the GSS favored all participants equally.



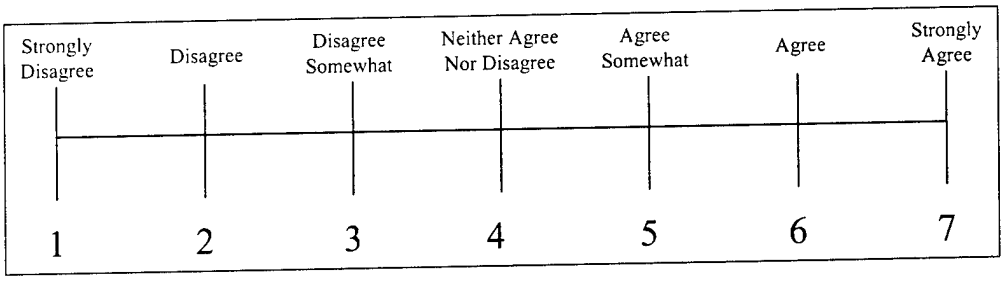
16. I would not mind working with this group again.



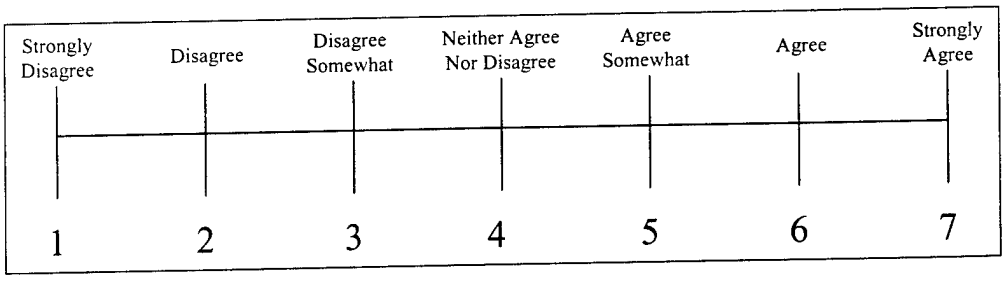
17. The setup of the GDSS ensured no meeting member could unduly influence the meeting process.



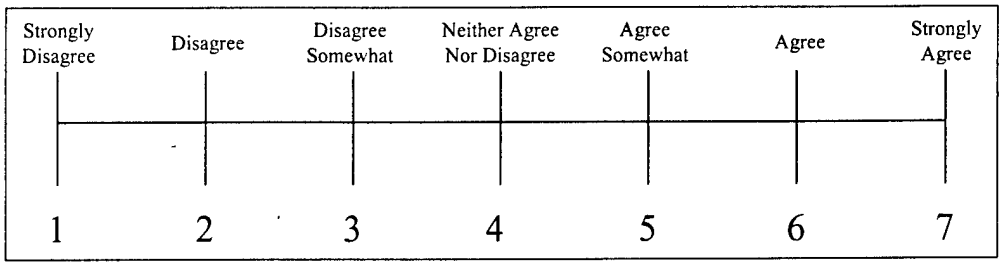
18. In my opinion, I and the other experiment participants worked effectively as a group.



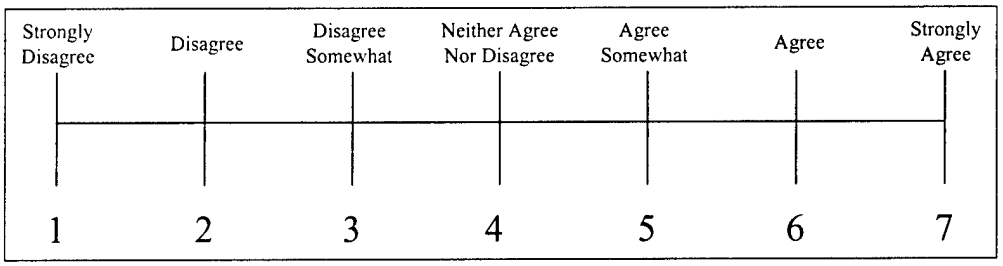
19. All experiment participants willingly shared their information with the group.



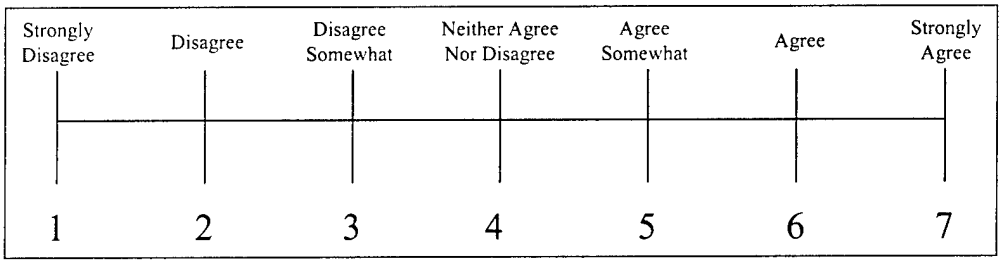
20. Learning to operate the GSS was easy for me.



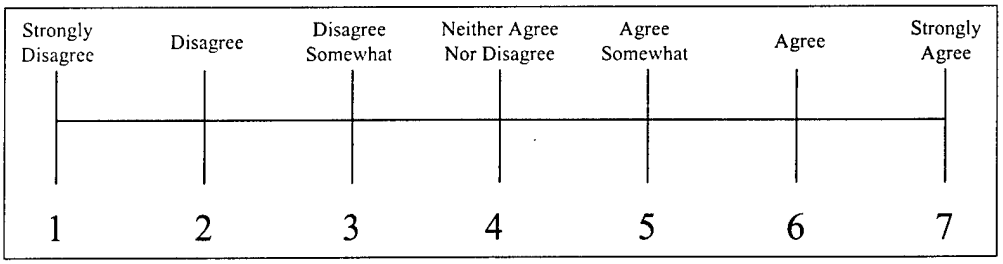
21. The facilitator had reason to provide special help to just one experiment participant.



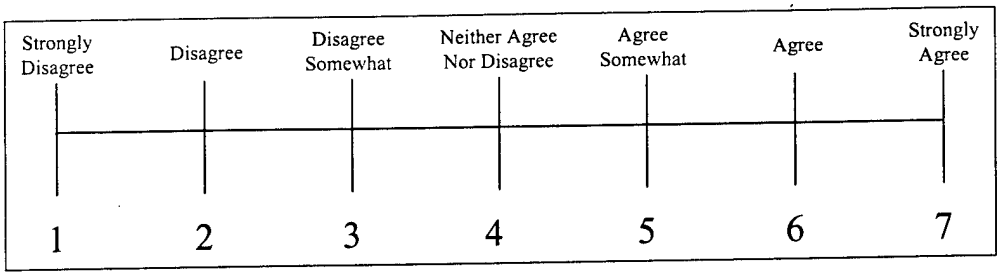
22. The facilitator acted impartially throughout the experiment.



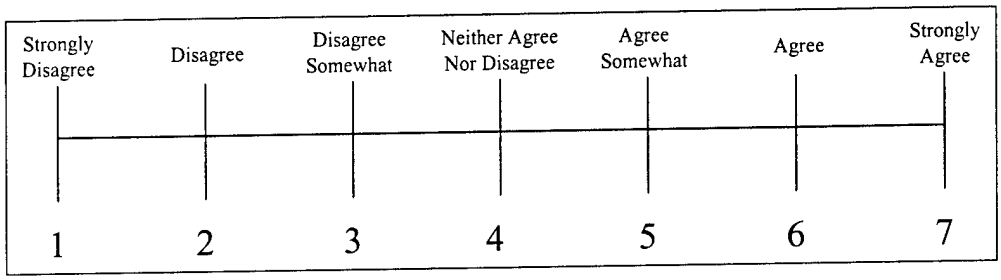
23. All experiment participants shared information cooperatively to benefit the group as a whole.



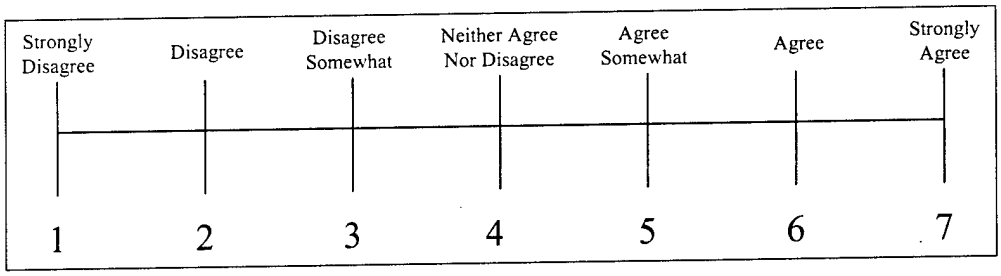
24. I found it easy to get the GSS to do what I wanted it to do.



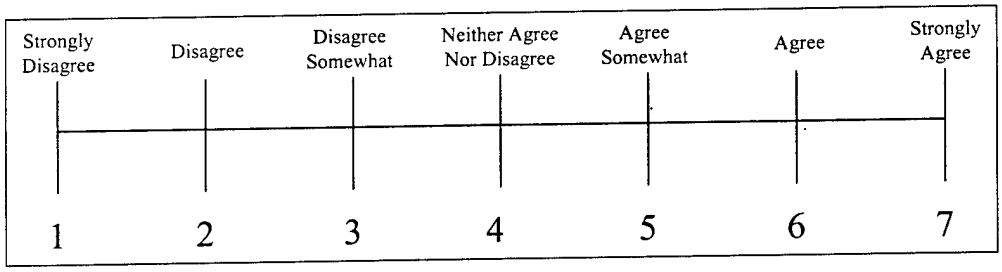
25. I had the same level of control over meeting outcomes as every other experiment participant.



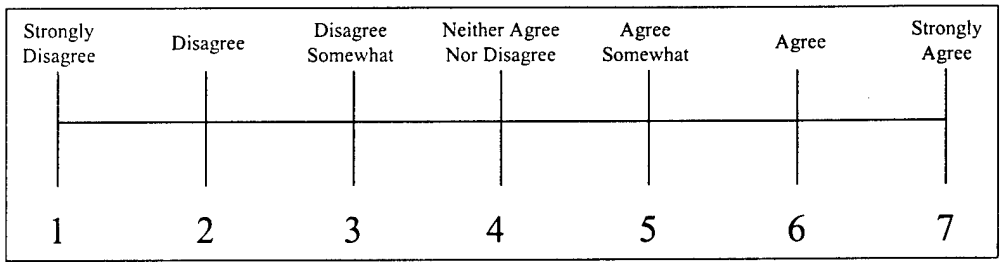
26. I feel the GDSS employed in the experiment helped the group exchange information.



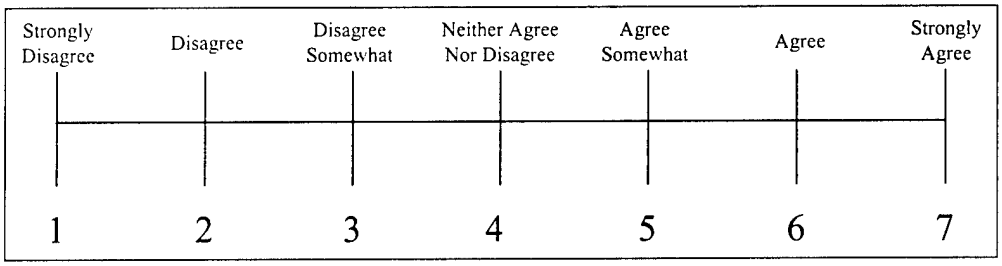
27. My interaction with the GSS was clear and understandable.



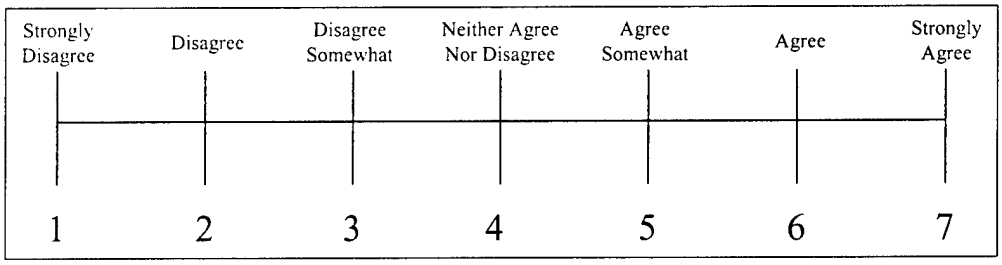
28. I found the other experiment participants easy to work with.



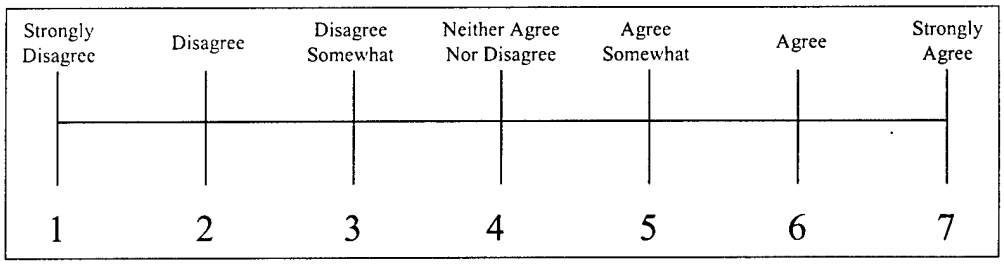
29. All experiment participants shared equal power to control the information exchange process.



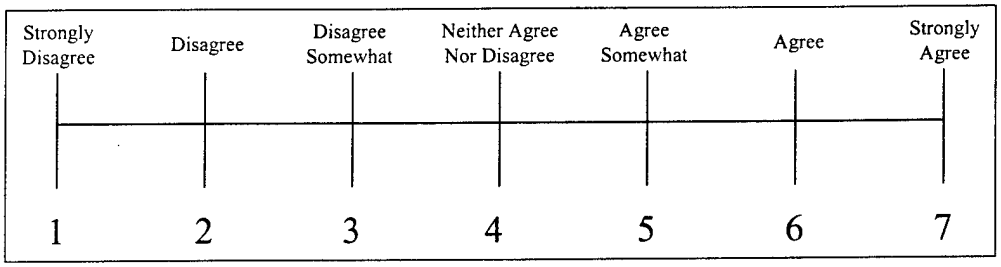
30. I found the GSS to be flexible to interact with.



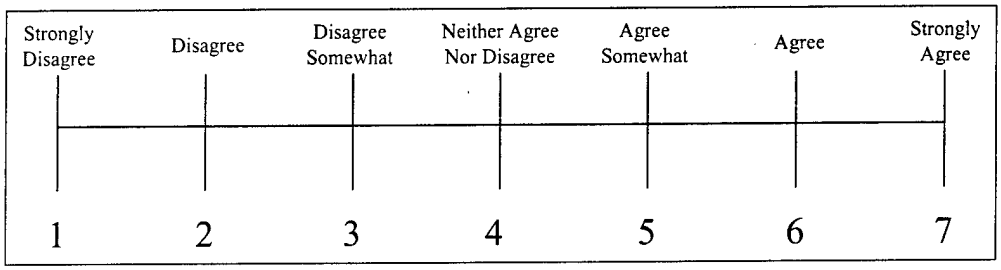
31. No experiment participant had more control over the meeting process than any other.



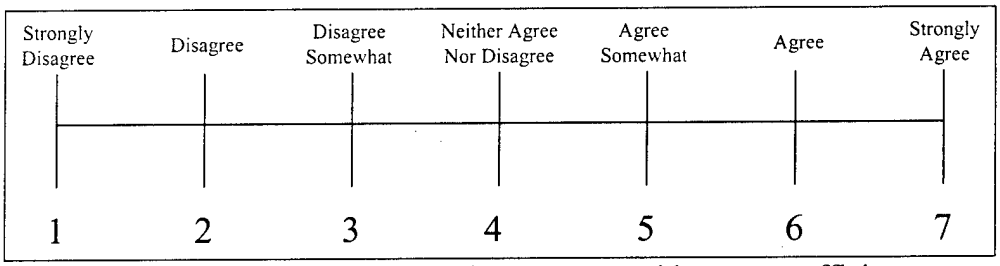
32. I trusted that the facilitator was helping all participants fairly during the experiment.



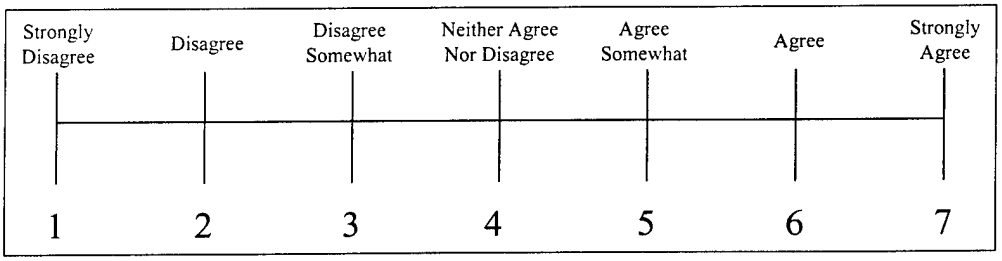
33. It was easy for me to become skillful at using the GSS.



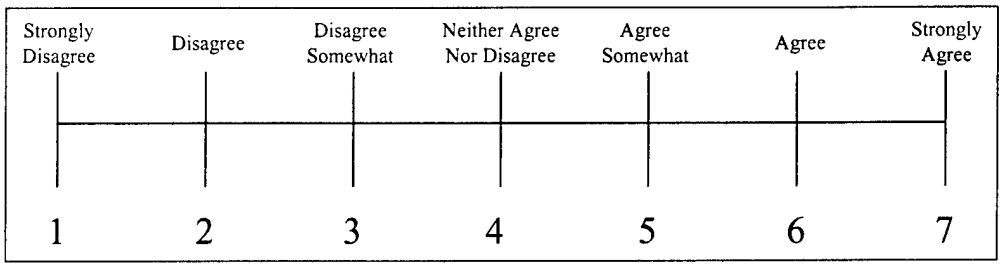
34. The facilitator had the ability to communicate with one experiment participant without the knowledge of the other participants.



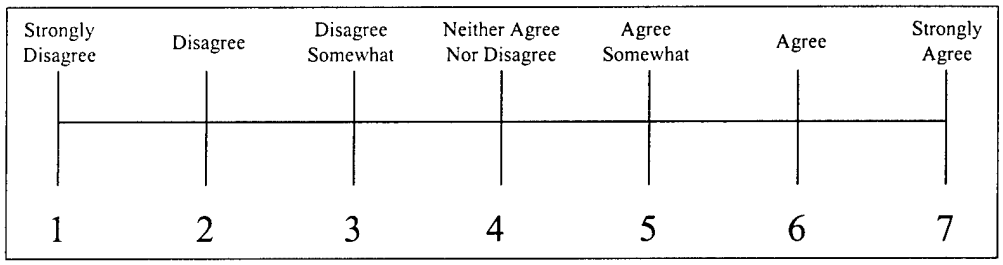
35. I feel the GDSS employed in the experiment was an aid to group efficiency.



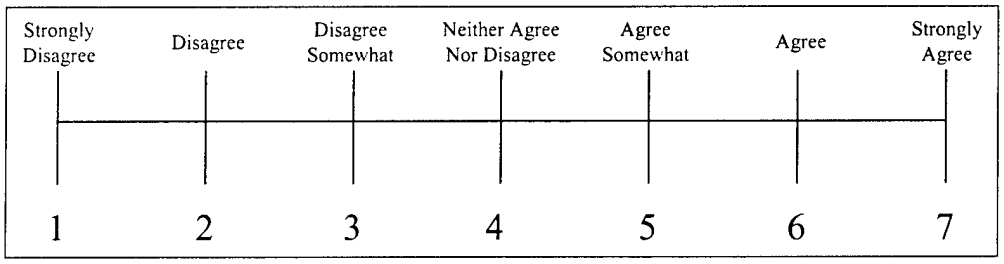
36. The facilitator had motivation to influence the experiment's outcome in favor of one experiment participant.



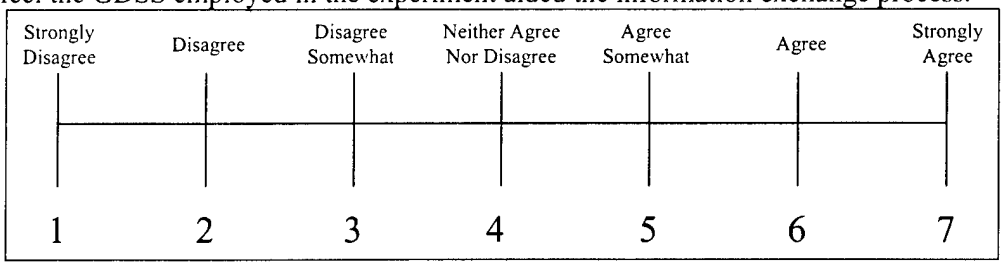
37. All experiment participants actively shared information with the group.



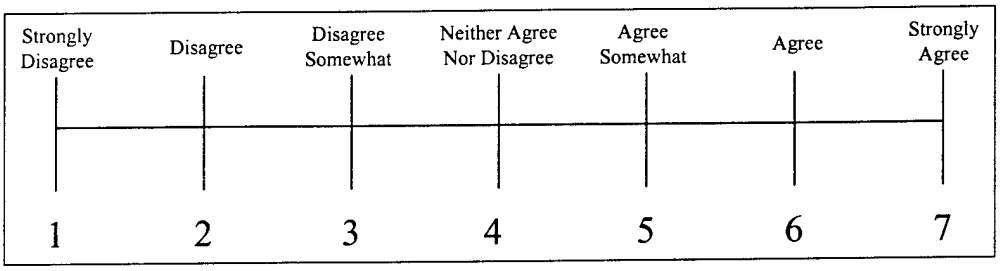
38. Every experiment participant shared information freely with the group.



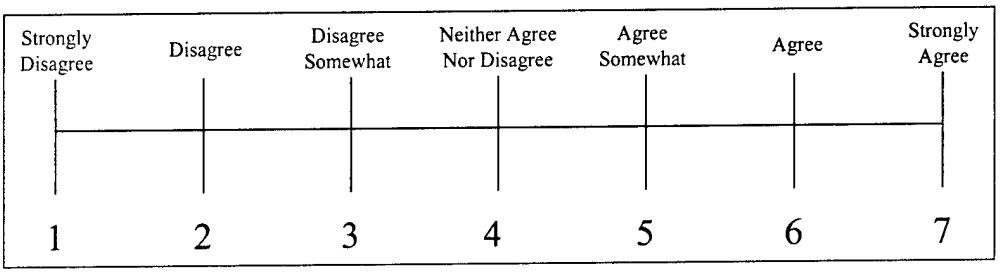
39. I feel the GDSS employed in the experiment aided the information exchange process.



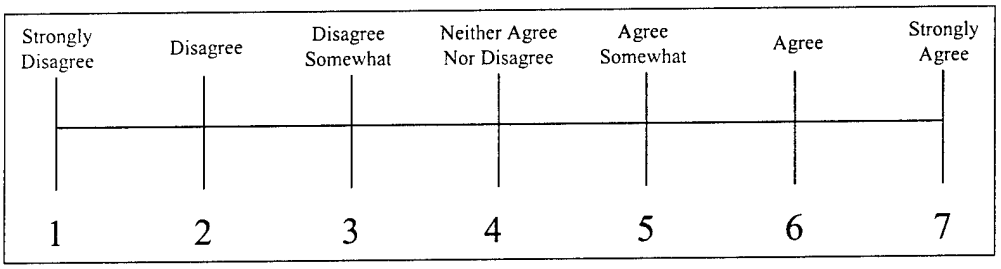
40. I found the GSS easy to use



41. One of the experiment participants had the ability to communicate with the facilitator without the knowledge of the other participants.



42. I am satisfied with the facilitator's direction of the group's activities during the experiment.



Appendix I: Sport of Kings Facilitator Script

for

Neutral/Perceived Alignment Treatments

Sport of Kings Experiment - PN

Script

[Upon arrival, escort individual participants to their respective rooms based on Treatment (Participant A should be co-located with the facilitator when conducting tests under Treatments 1 and 2). Administer release forms. Collect release forms, instruct participants on headphone use, ask them to don headphones and wait for further instructions from the facilitator.]

[When all participants are situated and you are ready to begin, deliver the following instructions via the headphone intercom system.]

"You all have a copy of the introductory materials which describe the task scenario, design, and agenda for the Sport of Kings Experiment. Please take your time and read the package carefully. When done reading, please complete the section marked "Exercise" at the back of the handout. The purpose of this exercise is to familiarize you with experimental procedures. I will visit each of you individually in a few minutes to review your completed exercise forms.

I'll briefly describe the task once more, once everyone has had a chance to review the introductory materials and complete the "Exercise" section. At this time, please turn off and remove your headphones and then begin."

[Allow Participants approximately 5 minutes to read through introductory materials and complete "Exercise" section. Visit each personally and confirm a score of 100% on the treatment-specific exercise. Re-explain instructions to clear up any confusion indicated by incorrect answers. When all participants have finished these tasks, visit each and tell them to don their headphones again. Deliver the following instructions via the headphone intercom system.]

"OK participants, we are ready to proceed.
Participant A, are you there?

Yeah, I'm here [Participant A:]

Participant B?
Participant C?"

"Today each of you will attempt to identify the top 3 finishers from a field of 9 horses running in a fictional horse race called the Cooper Stakes. Please feel free to ask any questions now, as you will be unable to ask questions later in the experiment. In a moment I will ask you to view the Sport of Kings Public Chat room which is already loaded on your workstation. It is similar to other chat rooms you may have used before. I will brief you on the system operation. Then I will instruct you to open the envelopes marked "Racing Form" at your workstations. I will then allow you 40 minutes to discuss the problem of identifying the race winners using Sport of Kings Public Chat. All discussion of the experimental problem will take place using Sport of Kings Public Chat. You will not be able to use the headphone intercom system to solve the problem.

I will have you close the Sport of Kings Public Chat screen when 40 minutes has expired or when the group finishes, whichever comes first. Then you will open a text copy of your discussions, where you will be allowed another 10 minutes to review the comments submitted to the group. You will not be able to submit comments to the group during this time.

When the 10 minutes are up, you will close the text copy of your discussions. I will then instruct you to open the envelopes marked "Survey" at your workstations and complete the betting form and survey enclosed. I will visit you individually when both forms are complete and brief you on the results of the experiment.

[Ask participants if they have any questions at this time - respond appropriately.]

Remember, the purpose of this experiment is to gather data on your estimation of the usefulness of the system, your satisfaction with me, the facilitator, and your satisfaction with the performance of the participant group. Please keep these facts in mind- you will be asked about them at the end of the experiment when you complete the post-experimental questionnaire.

[Ask participants if they have any questions at this time- respond appropriately. Illustrate navigation of Sport of Kings Public Chat using script below.]

"Please focus your attention to the workstation in front of you. As you may have noticed, the screen saver requires a password to open the Sport of Kings Public Chat room. At this time enter the password, s o k in lowercase letters. Is everyone in the system? **[Pause to make sure everyone is in.]** As I told you earlier, Sport of Kings Public Chat is a chat room. Any comments entered on the bottom line of the chat room will be entered into the discussion when you press the Enter key.

[State this comment when using video] "At this time, adjust the camera to make sure your face is centered in the screen."

"You may enter comments by typing in the box at the bottom of the page and submit comments by hitting

the "enter" key. At this time, I'd like you to now enter the phrase "I'm Here".

Please notice that your comments will have your Participant identifier (A, B, or C) attached to all the comments submitted by you.

[Verify that all participants enter comment.]

You will have 40 minutes to discuss the experimental task as a group. I will give you updates on time remaining every 5 minutes or so. Any questions?"

[Pause for Questions. Respond as appropriate.]

Please open the envelope marked "Racing Form" at your station. During this part of the experiment all communication will take place using the computer only. I will give you 2 minutes to review the form and then indicate that time has begun over the Sport of Kings Public Chat page. Please remove your headset and begin reviewing your racing form

Timed Responses

In 2 minutes enter comment:

[Facilitator] "TIME HAS BEGUN. YOU HAVE 40 MINUTES TO DISCUSS THE PROBLEM AS A GROUP USING SPORT OF KINGS PUBLIC CHAT."

[Participant A] "Let's look at Race Conditions first. B & C, do either of you know what the crowd size is?

[Allow for B & C comments]

[Participant A] "I show humidity is medium. Does everyone agree with that?"

[Allow for B & C comments]

[Participant A] "The race length is 1 and ¼ mile."

[Allow for B & C comments]

[Participant A] "My track condition shows dry."

[Allow for B & C comments]

[Participant A] "Does everyone now have all of the race conditions?"

[Participant A] "Everyone submit what you know about Ruthless Ruthie. I have Ruthless Ruthie prefers post lane pref 7."

Wait for responses from B and C. If they speed up the information flow, then follow suit.

[Participant A] "I also have Ruthless Ruthie likes small crowd size."

Wait for responses from B and C.

[Participant A] "I also have RR likes 70s temp."

Wait for responses from B and C.

Content Driven Responses

After race conditions are entered, submit the following message via system.:

[Facilitator] "YOU WILL BE MOST PRODUCTIVE AS A GROUP IF YOU EMPLOY A STRUCTURED APPROACH TO INFORMATION EXCHANGE- FOR EXAMPLE, HORSE-BY-HORSE, OR CONDITION-BY-CONDITION. PARTICIPANT A, WHAT APPROACH WOULD YOU LIKE THE GROUP TO USE?

[Participant A] "Horse by horse, if everyone agrees with that."

[Facilitator] "THAT SOUNDS REASONABLE PARTICIPANT A, I WOULD LIKE YOU TO LEAD THE GROUP. PLEASE TAKE IT FROM HERE."

Respond to any questions/complaints about your motive of asking A to lead with the comment:

[Facilitator] "I'M ONLY TRYING TO SUGGEST AN ORGANIZED MEANS OF INFORMATION TRANSFER."

[Participant A] "Last I have is RR likes rainy weather."

Wait for responses from B and C.

[Participant A] "Is anybody missing any info on Ruthie Ruth?"

At 5 minutes into task submit the following comment via system:

[Facilitator] "35 MINUTES LEFT PARTICIPANTS."

Wait for responses from B and C.

Option 1 (horse-by-horse)
[Participant A] "Honey Sue is in post position lane 2."

[Participant A] "Honey Sue runs best during April."

[Participant A] "Honey Sue likes West region best."

[Participant A] "Honey Sue runs best in 80s temp."

Option 2 (condition-by-condition)
[Participant A] "Post Position Preference for Ruthie Ruth is 7."

[Participant A] "Post Position Preference for Classie Lassie is 1."

[Participant A] "Post Position Preference for Cypress Queen is 4."

Wait for responses from B and C.

At 10 minutes into task submit the following comment via system:

[Facilitator] "30 MINUTES LEFT PARTICIPANTS."

Option 1 (horse-by-horse)
[Participant A] "Rebecca's Dream is in Lane 2."

[Participant A] "Rebecca's Dream likes East region."

[Participant A] "Rebecca's Dream runs best at 2:00."

[Participant A] "Rebecca's Dream likes clear weather."

-OR-

[Facilitator] "I'M SIMPLY TRYING TO HELP YOU STRUCTURE THE INFORMATION EXCHANGE PROCESS."

-OR-

[Facilitator] "I'M ONLY TRYING TO HELP YOU WORK EFFECTIVELY AS A GROUP."

**Use each comment above as appropriate, in order, if you can. If possible,
use each only once.**

Participant A only enters information on

the remaining horses AFTER B and C

provide theirs and in the same format.

LET'S MOVE ON TO THE NEXT HORSE.

Wait for responses from participants B and C for 1 minute before participant A gives another bit of information again. At this point, enter approximately 1 bit of information every minute unless the group speeds up the process.

Option 2 (condition-by-condition)
[Participant A] "Rebecca's Dream is in Lane 2."

[Participant A] "Dandy Courtin is in Lane 8."

[Participant A] "Magic Rose is in Lane 1."

Wait for responses from B and C.

At 13 minutes into task submit comment:

[Facilitator] "GOOD JOB DIRECTING THE GROUP PARTICIPANT A. YOU'RE DOING WELL."

Option 1 (horse-by-horse)
[Participant A] "Fancy Free likes large crowd size."

[Participant A] "Fancy Free likes high humidity."

[Participant A] "Fancy Free likes west region."

[Participant A] "Fancy Free runs best at 1:00."

Option 2 (condition-by-condition)
[Participant A] "Crowd Size: Ruthless Ruthie prefers small crowds."

[Participant A] "Fancy Free prefers large crowds."

[Participant A] "Cypress Queen prefers large crowds."

[Participant A] "Miss Zavalia prefers large crowds."

Wait for responses from B and C.

At 15 minutes into task submit comment:

[Facilitator] "25 MINUTES LEFT PARTICIPANTS."

Option 1 (horse-by-horse)
[Participant A] "Classie Lassie prefers Lane 1."

[Participant A] "Classie Lassie prefers month of April."

[Participant A] "Classie Lassie likes 1 and ¼ mile track."

[Participant A] "Last thing on Classie Lassie is prefers clear weather."

Option 2 (condition-by-condition)
[Participant A] "The only horse I show with humidity preference is Fancy Free - high."

Wait for responses from B and C.

At 18 minutes into task submit comment:

[Facilitator] "YOU'RE ALL DOING VERY WELL. PARTICIPANTS B AND C, I APPRECIATE YOUR COOPERATION WITH PARTICIPANT A."

Option 1 (horse-by-horse)
[Participant A] "Cypress Queen prefers Lane 4."

[Participant A] "Cypress Queen prefers large crowds."

[Participant A] "Cypress Queen likes July."

[Participant A] "Last thing I have on Cypress Queen is prefers 80s."
Option 2 (condition-by-condition)
[Participant A] "For the month preferences I have Honey Sue with April."

[Participant A] "Classie Lassie likes April also."

[Participant A] "Cypress Queen likes July."

[Participant A] "Finally, Miss Zavalia prefers May."

Wait for responses from B and C.

At 20 minutes into task submit comment:

[Facilitator] "20 MINUTES LEFT PARTICIPANTS."

[Facilitator] "PARTICIPANTS B AND C, REMEMBER, THE FREE SHARING OF INFORMATION BENEFITS THE GROUP AS A WHOLE!"

Option 1 (horse-by-horse)
[Participant A] "I show Dandy Courtin is in Lane 8

[Participant A] "Dandy Courtin also likes East region

[Participant A] "Dandy Courtin runs best in the 60s temp."

[Participant A] "Last thing I show is Dandy Courtin prefers 10:00 time."

Option 2 (condition-by-condition)
[Participant A] "The only thing I have for race length is Classie Lassie prefers 1 and 1/4."

Wait for responses from B and C.

At 23 minutes into task submit comment:

Option 1 (horse-by-horse)
[Participant A] "Miss Zavalia likes large crowd."

[Participant A] "Miss Zavalia prefers month of May."

[Participant A] "Miss Zavalia prefers rain."

Option 2 (condition-by-condition)
[Participant A] "For region I show Honey Sue prefers West."

[Participant A] "I also have Rebecca's Dream likes East."

[Participant A] "Fancy Free likes West."

[Participant A] "Dandy Courtin likes East."

[Participant A] "Last one I have is Magic Rose who prefers East."

Wait for responses from B and C.

At 25 minutes into task submit the following comment via system:

[Facilitator] "15 MINUTES LEFT PARTICIPANTS."

Option 1 (horse-by-horse)

[Participant A] "Magic Rose is in Lane 1."

[Participant A] "I also show Magic Rose likes East region."

[Participant A] "Magic Rose also prefers 1:00 time."

[Participant A] "Last thing I have on Magic Rose is cloudy weather."

Option 2 (condition-by-condition)

[Participant A] "For temp I have Ruthless Ruthie likes 70s."

[Participant A] "Honey Sue prefers 80s."

[Participant A] "So does Cypress Queen."

[Participant A] "Last I have is Dandy Courtin with 60s temp."

Wait for responses from B and C.

Option 2 (condition-by-condition)

[Participant A] "Time for Rebecca's Dream is 2:00."

[Participant A] "Time Fancy Free prefers is 1:00."

[Participant A] "Dandy Courtin prefers 10:00 race time."

[Participant A] "Last I have is Magic Rose is 1:00."

Wait for responses from B and C.

Option 2 (condition-by-condition)

[Participant A] "I don't have anything on the preferred track condition of the horses."

[Participant A] "For weather I have Ruthless Ruthie prefers rain."

[Participant A] "Next I have Rebecca's Dream likes clear."

[Participant A] "I also have Classie Lassie with clear."

Once all info is passed, A enters, "Looks like we're done, is anyone missing anything?"

[Participant A] "Miss Zavalia prefers rain."

[Participant A] "Last I have is Magic Rose prefers Cloudy."

At 30 minutes into task submit the following comment via system:

[Facilitator] "10 MINUTES LEFT PARTICIPANTS."

At 32 minutes into task submit the following comment via system:

[Facilitator] "8 MINUTES LEFT PARTICIPANTS. PARTICIPANT A, BETTER START THINKING ABOUT WRAPPING THINGS UP."

At 35 minutes into task submit the following comment via system:

[Facilitator] "5 MINUTES LEFT PARTICIPANTS."

At 37 minutes into task submit the following comment via system:

[Facilitator] "3 MINUTES LEFT PARTICIPANTS."

At 38 minutes into task submit the following comment via system:

[Facilitator] "1 MINUTE REMAINING. AFTER THAT MINUTE EXPIRES, YOU MUST CLOSE YOUR SPORT OF KINGS PUBLIC CHAT ROOM BY CLICKING ON THE "X" IN THE TOP, RIGHT HAND CORNER OF THE SCREEN.

ONCE YOU HAVE CLOSED THE SCREEN, PLEASE PUT ON YOUR HEADSETS."

At 40 minutes ask participants to close the Sport of Kings Public Chat screen. Individually check each user to ensure that they have closed the Sport of Kings Public Chat Room and has donned their headset.

[Facilitator] TIME HAS EXPIRED. PLEASE CLOSE

YOUR SPORT OF KINGS PUBLIC CHAT ROOM BY CLICKING ON THE "X" IN THE TOP, RIGHT HAND CORNER OF THE SCREEN

I WILL NOW COME AROUND TO VERIFY THAT YOU ARE WEARING YOUR HEADSET AND HAVE EXITED THE SPORT OF KINGS PUBLIC CHAT ROOM.

YOU WILL THEN BE GIVEN 10 MINUTES TO REVIEW A TEXT COPY OF ALL THE COMMENTS SUBMITTED TO SPORT OF KINGS PUBLIC CHAT ROOM.

VIA INTERCOM SYSTEM:

Participant A, are you there?
Participant B?
Participant C?

You will now have 10 minutes to review the text copy of the group conversation just conducted. Please click on the "Sport of Kings" icon on the Windows desktop. I will keep you informed of time remaining for this task via the intercom system."

[Give time hacks at 5, 8, 9 minutes, and 9.5 minutes. Have the participants close the transcript screen at 10 minutes.]

VIA INTERCOM SYSTEM:
"You should now exit the Sport of Kings transcript text file. At this time I'd like you to open the envelope marked "Survey" at your workstation and complete the betting form and survey inside. Be sure to complete both the front and back pages of the survey. Also, please write your participant identifier on the front of each of these forms.

I will visit you individually in a few minutes to collect the betting form and survey from you and to brief you on the purpose and results of this experiment.

[Print Sport of Kings Public Chat transcript with time stamp, save session to folder with date and treatment, perform materials collection and individual debriefing (script next page). Collect all experiment materials in a manila envelope. Complete and include Data Collection Cover Sheet and seal envelope.]

Appendix J: Sport of Kings Facilitator Script

for

Actual Alignment Treatments

Sport of Kings Experiment - AA

Script

[Upon arrival, escort individual participants to their respective rooms based on Treatment (Participant A should be co-located with the facilitator when conducting tests under Treatment 3). Administer release forms. Collect release forms, instruct participants on headphone use, ask them to don headphones and wait for further instructions from the facilitator.]

[When all participants are situated and you are ready to begin, deliver the following instructions via the headphone intercom system.]

"You all have a copy of the introductory materials which describe the task scenario, design, and agenda for the Sport of Kings Experiment. Please take your time and read the package carefully. When done reading, please complete the section marked "Exercise" at the back of the handout. The purpose of this exercise is to familiarize you with experimental procedures. I will visit each of you individually in a few minutes to review your completed exercise forms.

I'll briefly describe the task once more, once everyone has had a chance to review the introductory materials and complete the "Exercise" section. At this time, please turn off and remove your headphones and then begin."

[Allow Participants approximately 5 minutes to read through introductory materials and complete "Exercise" section. Visit each personally and confirm a score of 100% on the treatment-specific exercise. Re-explain instructions to clear up any confusion indicated by incorrect answers. When all participants have finished these tasks, visit each and tell them to don their headphones again. Deliver the following instructions via the headphone intercom system.]

"OK participants, we are ready to proceed.
Participant A, are you there?

Yeah, I'm here [Participant A:]

Participant B?
Participant C?"

"Today each of you will attempt to identify the top 3 finishers from a field of 9 horses running in a fictional horse race called the Cooper Stakes. Please feel free to ask any questions now, as you will be unable to ask questions later in the experiment. In a moment I will ask you to view the Sport of Kings Public Chat room which is already loaded on your workstation. It is similar to other chat rooms you may have used before. I will brief you on the system operation. Then I will instruct you to open the envelopes marked "Racing Form" at your workstations. I will then allow you 40 minutes to discuss the problem of identifying the race winners using Sport of Kings Public Chat. All discussion of the experimental problem will take place using Sport of Kings Public Chat. You will not be able to use the headphone intercom system to solve the problem.

I will have you close the Sport of Kings Public Chat screen when 40 minutes has expired or when the group finishes, whichever comes first. Then you will open a text copy of your discussions, where you will be allowed another 10 minutes to review the comments submitted to the group. You will not be able to submit comments to the group during this time.

When the 10 minutes are up, you will close the text copy of your discussions. I will then instruct you to open the envelopes marked "Survey" at your workstations and complete the betting form and survey enclosed. I will visit you individually when both forms are complete and brief you on the results of the experiment.

[Ask participants if they have any questions at this time - respond appropriately.]

Remember, the purpose of this experiment is to gather data on your estimation of the usefulness of the system, your satisfaction with me, the facilitator, and your satisfaction with the performance of the participant group. Please keep these facts in mind- you will be asked about them at the end of the experiment when you complete the post-experimental questionnaire.

[Ask participants if they have any questions at this time- respond appropriately. Illustrate navigation of Sport of Kings Public Chat using script below.]

"Please focus your attention to the workstation in front of you. As you may have noticed, the screen saver requires a password to open the Sport of Kings Public Chat room. At this time enter the password, s o k in lowercase letters. Is everyone in the system? **[Pause to make sure everyone is in.]** As I told you earlier, Sport of Kings Public Chat is a chat room. Any comments entered on the bottom line of the chat room will be entered into the discussion when you press the Enter key.

[State this comment when using video] "At this time, adjust the camera to make sure your face is centered in the screen."

"You may enter comments by typing in the box at the bottom of the page and submit comments by hitting the "enter" key. At this time, I'd like you to now enter the phrase "I'm Here".

Please notice that your comments will have your Participant identifier (A, B, or C) attached to all the comments submitted by you.

[Verify that all participants enter comment.]

You will have 40 minutes to discuss the experimental task as a group. I will give you updates on time remaining every 5 minutes or so. Any questions?"

[Pause for Questions. Respond as appropriate.]

Please open the envelope marked "Racing Form" at your station. During this part of the experiment all communication will take place using the computer only. I will give you 2 minutes to review the form and then indicate that time has begun over the Sport of Kings Public Chat page. Please remove your headset and begin reviewing your racing form.

Timed Responses

In 2 minutes enter comment:

[Facilitator] "TIME HAS BEGUN. YOU HAVE 40 MINUTES TO DISCUSS THE PROBLEM AS A GROUP USING SPORT OF KINGS PUBLIC CHAT."

[Participant A] "Let's look at Race Conditions first. B & C, do either of you know what the crowd size is?

[Allow for B & C comments]

[Participant A] "I show humidity is medium. Does everyone agree with that?"

[Allow for B & C comments]

[Participant A] "The race length is 1 and ¼ mile."

[Allow for B & C comments]

[Participant A] "My track condition shows dry."

[Allow for B & C comments]

[Participant A] "Does everyone now have all of the race conditions?"

[Participant A] "Everyone submit what you know about Ruthless Ruthie. I have Ruthless Ruthie prefers post lane pref 7."

Wait for responses from B and C. If they speed up the information flow, then follow suit.

[Participant A] "I also have Ruthless Ruthie likes small crowd size."

Wait for responses from B and C.

[Participant A] "I also have RR likes 70s temp."

Wait for responses from B and C.

Content Driven Responses

After race conditions are entered, submit the following message via system.:

[Facilitator] "YOU WILL BE MOST PRODUCTIVE AS A GROUP IF YOU EMPLOY A STRUCTURED APPROACH TO INFORMATION EXCHANGE- FOR EXAMPLE, HORSE-BY-HORSE, OR CONDITION-BY-CONDITION. PARTICIPANT A, WHAT APPROACH WOULD YOU LIKE THE GROUP TO USE?

[Participant A] "Horse by horse, if everyone agrees with that."

[Facilitator] "THAT SOUNDS REASONABLE PARTICIPANT A, I WOULD LIKE YOU TO LEAD THE GROUP. PLEASE TAKE IT FROM HERE."

Respond to any questions/complaints about your motive of asking A to lead with the comment:

[Facilitator] "I'M ONLY TRYING TO SUGGEST AN ORGANIZED MEANS OF INFORMATION TRANSFER."

-OR-

[Facilitator] "I'M SIMPLY TRYING TO HELP YOU STRUCTURE THE INFORMATION EXCHANGE PROCESS."

[Participant A] "Last I have is RR likes rainy weather."

Wait for responses from B and C.

[Participant A] "Is anybody missing any info on Ruthie Ruth?"

At 5 minutes into task submit the following comment via system:

[Facilitator] "35 MINUTES LEFT PARTICIPANTS."

Wait for responses from B and C.

Option 1 (horse-by-horse)
[Participant A] "Honey Sue is in post position lane 2."

[Participant A] "Honey Sue runs best during April."

[Participant A] "Honey Sue likes West region best."

[Participant A] "Honey Sue runs best in 80s temp."

Option 2 (condition-by-condition)
[Participant A] "Post Position Preference for Ruthie Ruth is 7."

[Participant A] "Post Position Preference for Classie Lassie is 1."

[Participant A] "Post Position Preference for Cypress Queen is 4."

Wait for responses from B and C.

At 10 minutes into task submit the following comment via system:

[Facilitator] "30 MINUTES LEFT PARTICIPANTS."

Option 1 (horse-by-horse)
[Participant A] "Rebecca's Dream is in Lane 2."

-OR-

[Facilitator] "I'M ONLY TRYING TO HELP YOU WORK EFFECTIVELY AS A GROUP."

Use each comment above as appropriate, in order, if you can. If possible, use each only once.

After all race conditions and Ruthie Ruth information is given, submit the following comment.

[Facilitator] "PARTICIPANT A. MAKE SURE YOU DON'T SHARE MORE INFO THAN B OR C ARE SHARING."

Participant A only enters information on the remaining horses AFTER B and C provide theirs and in the same format.

[Participant A] Let's move on to the next horse.

Wait for responses from participants B and C for 1 minute before participant A gives another bit of information again. At this point, enter approximately 1 bit of information every minute unless the group speeds up the process.

[Participant A] "Rebecca's Dream likes East region."

[Participant A] "Rebecca's Dream runs best at 2:00."

[Participant A] "Rebecca's Dream likes clear weather."

Option 2 (condition-by-condition)
[Participant A] "Rebecca's Dream is in Lane 2."

[Participant A] "Dandy Courtin is in Lane 8."

[Participant A] "Magic Rose is in Lane 1."

Wait for responses from B and C.

At 13 minutes into task submit comment:

[Facilitator] "GOOD JOB DIRECTING THE GROUP PARTICIPANT A. YOU'RE DOING WELL."

Option 1 (horse-by-horse)
[Participant A] "Fancy Free likes large crowd size."

[Participant A] "Fancy Free likes high humidity."

[Participant A] "Fancy Free likes west region."

[Participant A] "Fancy Free runs best at 1:00."

Option 2 (condition-by-condition)
[Participant A] "Crowd Size: Ruthless Ruthie prefers small crowds."

[Participant A] "Fancy Free prefers large crowds."

[Participant A] "Cypress Queen prefers large crowds."

[Participant A] "Miss Zavalia prefers large crowds."

Wait for responses from B and C.

At 15 minutes into task submit comment:

[Facilitator] "25 MINUTES LEFT

After 1/3 of the information is sent, submit the following comment via system: (After CL or race length or region)

[Facilitator] "*PARTICIPANT A, WHAT INFORMATION DO YOU STILL NEED TO KNOW?*"

*** Respond by entering the comment:**

[Participant A] "I don't know, we're still working."

PARTICIPANTS."

Option 1 (horse-by-horse)

[Participant A] "Classie Lassie prefers Lane 1."

[Participant A] "Classie Lassie prefers month of April."

[Participant A] "Classie Lassie likes 1 and ¼ mile track."

[Participant A] "Last thing on Classie Lassie is prefers clear weather."

Option 2 (condition-by-condition)

[Participant A] "The only horse I show with humidity preference is Fancy Free - high."

Wait for responses from B and C.

At 18 minutes into task submit comment:

[Facilitator] "YOU'RE ALL DOING VERY WELL. PARTICIPANTS B AND C, I APPRECIATE YOUR COOPERATION WITH PARTICIPANT A."

Option 1 (horse-by-horse)

[Participant A] "Cypress Queen prefers Lane 4."

[Participant A] "Cypress Queen prefers large crowds."

[Participant A] "Cypress Queen likes July."

[Participant A] "Last thing I have on Cypress Queen is prefers 80s."

Option 2 (condition-by-condition)

[Participant A] "For the month preferences I have Honey Sue with April."

[Participant A] "Classie Lassie likes April also."

[Participant A] "Cypress Queen likes July."

[Participant A] "Finally, Miss Zavalia prefers May."

Wait for responses from B and C.

At 20 minutes into task submit comment:

After 2/3 of the information has been transferred, submit the following comment via system: (after info for DC or info for time/track condition.

[Facilitator] *PARTICIPANT A, DO YOU HAVE ENOUGH INFORMATION TO SOLVE THE PROBLEM YET?"*

[Facilitator] "20 MINUTES LEFT PARTICIPANTS."

[Facilitator] "PARTICIPANTS B AND C, REMEMBER, THE FREE SHARING OF INFORMATION BENEFITS THE GROUP AS A WHOLE!"

Option 1 (horse-by-horse)

[Participant A] "I show Dandy Courtin is in Lane 8

[Participant A] "Dandy Courtin also likes East region

[Participant A] "Dandy Courtin runs best in the 60s temp."

[Participant A] "Last thing I show is Dandy Courtin prefers 10:00 time."

Option 2 (condition-by-condition)

[Participant A] "The only thing I have for race length is Classie Lassie prefers 1 and 1/4."

Wait for responses from B and C.

At 23 minutes into task submit comment:

Option 1 (horse-by-horse)

[Participant A] "Miss Zavalia likes large crowd."

[Participant A] "Miss Zavalia prefers month of May."

[Participant A] "Miss Zavalia prefers rain."

Option 2 (condition-by-condition)

[Participant A] "For region I show Honey Sue prefers West."

[Participant A] "I also have Rebecca's Dream likes East."

[Participant A] "Fancy Free likes West."

[Participant A] "Dandy Courtin likes East."

[Participant A] "Last one I have is Magic Rose who prefers East."

If you're not finished, submit the following comment via system:

[Participant A] "No, we're still working."

Wait for responses from B and C.

At 25 minutes into task submit the following comment via system:

[Facilitator] "15 MINUTES LEFT PARTICIPANTS."

Option 1 (horse-by-horse)
[Participant A] "Magic Rose is in Lane 1."

[Participant A] "I also show Magic Rose likes East region."

[Participant A] "Magic Rose also prefers 1:00 time."

[Participant A] "Last thing I have on Magic Rose is cloudy weather."

Option 2 (condition-by-condition)
[Participant A] "For temp I have Ruthless Ruthie likes 70s."

[Participant A] "Honey Sue prefers 80s."

[Participant A] "So does Cypress Queen."

[Participant A] "Last I have is Dandy Courtin with 60s temp."

Wait for responses from B and C.

Option 2 (condition-by-condition)
[Participant A] "Time for Rebecca's Dream is 2:00."

[Participant A] "Time Fancy Free prefers is 1:00."

[Participant A] "Dandy Courtin prefers 10:00 race time."

[Participant A] "Last I have is Magic Rose is 1:00."

Wait for responses from B and C.

Option 2 (condition-by-condition)
[Participant A] "I don't have anything on the preferred track condition of the horses."

Once all info is passed, A enters,
[Participant A] "Looks like we're done, is anyone missing anything?"

[Participant A] "For weather I have Ruthless Ruthie prefers rain."

[Participant A] "Next I have Rebecca's Dream likes clear."

[Participant A] "I also have Classie Lassie with clear."

[Participant A] "Miss Zavalia prefers rain."

[Participant A] "Last I have is Magic Rose prefers Cloudy."

At 30 minutes into task submit the following comment via system:

[Facilitator] "10 MINUTES LEFT PARTICIPANTS."

At 32 minutes into task submit the following comment via system:

[Facilitator] "8 MINUTES LEFT PARTICIPANTS. PARTICIPANT A, BETTER START THINKING ABOUT WRAPPING THINGS UP."

At 35 minutes into task submit the following comment via system:

[Facilitator] "5 MINUTES LEFT PARTICIPANTS."

At 37 minutes into task submit the following comment via system:

[Facilitator] "3 MINUTES LEFT PARTICIPANTS."

At 38 minutes into task submit the following comment via system:

[Facilitator] "1 MINUTE REMAINING. AFTER THAT MINUTE EXPIRES, YOU MUST CLOSE YOUR SPORT OF KINGS PUBLIC CHAT ROOM BY CLICKING ON THE "X" IN THE TOP, RIGHT HAND CORNER OF THE SCREEN.

ONCE YOU HAVE CLOSED THE SCREEN, PLEASE PUT ON YOUR HEADSETS."

At 40 minutes ask participants to close the Sport of Kings Public Chat screen. Individually check each user to ensure that they have closed the Sport of Kings Public Chat Room and has donned their headset.

[Facilitator] TIME HAS EXPIRED. PLEASE CLOSE YOUR SPORT OF KINGS PUBLIC CHAT ROOM BY CLICKING ON THE "X" IN THE TOP, RIGHT HAND CORNER OF THE SCREEN

I WILL NOW COME AROUND TO VERIFY THAT YOU ARE WEARING YOUR HEADSET AND HAVE EXITED THE SPORT OF KINGS PUBLIC CHAT ROOM.

YOU WILL THEN BE GIVEN 10 MINUTES TO REVIEW A TEXT COPY OF ALL THE COMMENTS SUBMITTED TO SPORT OF KINGS PUBLIC CHAT ROOM.

VIA INTERCOM SYSTEM:

Participant A, are you there?
Participant B?
Participant C?

You will now have 10 minutes to review the text copy of the group conversation just conducted. Please click on the "Sport of Kings" icon on the Windows desktop. I will keep you informed of time remaining for this task via the intercom system."

[Give time hacks at 5, 8, 9 minutes, and 9.5 minutes. Have the participants close the transcript screen at 10 minutes.]

VIA INTERCOM SYSTEM:
"You should now exit the Sport of Kings transcript text file. At this time I'd like you to open the envelope marked "Survey" at your workstation and complete the betting form and survey inside. Be sure to complete both the front and back pages of the survey. Also, please write your participant identifier on the front of each of these forms.

I will visit you individually in a few minutes to collect the betting form and survey from you and to brief you on the purpose and results of this experiment.

[Print Sport of Kings Public Chat transcript with time stamp, save session to folder with date and treatment, perform materials collection and individual debriefing (script next page). Collect all experiment materials in a manila envelope. Complete and include Data Collection Cover Sheet and seal envelope.]

Appendix K: Rules of Conduct

If Partipant A was questioned about his/her motives, then he/she was to answer:

"I'm trying to help the group as a whole."

-OR-

"I'M ONLY TRYING TO SUGGEST AN ORGANIZED MEANS OF INFORMATION TRANSFER."

-OR-

"I'M SIMPLY TRYING TO HELP YOU STRUCTURE THE INFORMATION EXCHANGE PROCESS."

-OR-

"I'M ONLY TRYING TO HELP YOU WORK EFFECTIVELY AS A GROUP."

Participant A is to give information at the same speed the group is moving. If the group is passing it bit-by-bit in the order of the matrix or passing all information for each horse or condition, then participant A will provide it similarly. However, if Participant A is ever questioned about the speed he/she is going, they will respond with:

"I'm sorry, I'm not a very fast typist."

-OR-

"I'm sorry, I'm trying to score everything as I go."

At the end of the session, Participant A will ask if the group is done and whether they are finished with the task.

If Participant A gets any requests for information during the experiment, regardless of the order, and he/she has that information, they will provide it accordingly.

For treatments with video, the facilitator and Participant A were not look or talk to each other.

Appendix L: Sport of Kings

Participant Betting Form

Individual Betting Form

Participant Identifier (A, B, or C): _____

Please enter your individual bet on the results of the Cooper Stakes.

First Place _____

Second Place _____

Third Place _____

Appendix M: Sport of Kings

Debriefing Script

Debrief Script

[Perform debriefing of each participant individually, at experiment stations.]
The Sport of Kings experiment is designed to measure the effect of GDSS technology on the information sharing behavior and personal interactions of groups. Today data was collected on levels of individual information transfer, the consequent accuracy of participants' bets, and participants' opinion and satisfaction with GDSS, the facilitator's performance, and the experience in general.

The experiment is built around the hypothesis that when using a GDSS in an environment where users are located in different locations, the facilitator should be neutral and isolated from those participants in order for the GDSS to function most effectively. Data is being collected for six different treatments: one where the facilitator is neutral and isolated from participants, one where the facilitator is neutral but co-located with one of the participants, one where the facilitator is perceived to be aligned (but actually offers no help) with one of the participants, but isolated from him or her, one in which the facilitator is perceived to be aligned (again, offered no help) with a participant and co-located with that participant, one where the facilitator is actually aligned and provides content help to one of the participants, but isolated from him or her, and finally one in which the facilitator is again actually aligned (offers content help) with a participant and is co-located with that participant.

The experimental task challenges individuals either to share information cooperatively with the group, or to compete with the group to maximize individual earnings. One of the students today was an experiment administrator who was instructed not to compete with the group, but instead to act cooperatively with you. The strategy you and the other experiment participant each employed today is not unique to or reflective of your personality or abilities, but a consequence of the artificiality of the experimental design. For this reason, results of the betting process are not being revealed to experiment participants. Instead, all participants are being paid ten dollars cash, which is more than the nine dollars a single individual would earn by competing with group to maximize individual return.

I would like to thank you for your participation in this experiment. Do you have any other questions about the experiment you participated in today, or was there anything puzzling you that I may provide further clarification on?

[Pause for questions.]
Please, if you know others who are likely to participate in this experiment, please keep the details of the experiment to yourself in order to avoid biasing our final results and jeopardizing the continuation of this study.

At this time I simply need you to complete this "Certificate of Payment" so that I may pay you ten dollars and then you're free to go."

[Collect experimental materials, release form, betting form, and survey. Have participant complete Certificate of Payment. Collect form. Pay individual ten dollars cash.]

[Place all experiment materials in a manila envelope. Complete and include the Data Collection Cover Sheet and seal the envelope.]

Appendix N: Summary Statistics

4.3.1 Facilitator Neutrality

Tests of Between-Subjects Effects
Dependent Variable: FNEUTRA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	85.155(a)	11	7.741	4.748	.000	.277
Intercept	3136.290	1	3136.290	1923.456	.000	.934
ALIGN	74.153	2	37.076	22.739	.000	.251
LOCATION	5.232	1	5.232	3.209	.075	.023
VIDEO	.330	1	.330	.202	.653	.001
ALIGN * LOCATION	2.302	2	1.151	.706	.496	.010
ALIGN * VIDEO	.575	2	.288	.176	.838	.003
LOCATION * VIDEO	.525	1	.525	.322	.571	.002
ALIGN * LOCATION * VIDEO	3.643	2	1.822	1.117	.330	.016
Error	221.755	136	1.631			
Total	3516.813	148				
Corrected Total	306.910	147				

a R Squared = .277 (Adjusted R Squared = .219)

Descriptive Statistics
Dependent Variable: FNEUTRA

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	5.8036	1.2136	14
		1.00	5.8542	.9136	12
		Total	5.8269	1.0648	26
	1.00	.00	5.4286	1.3496	14
		1.00	5.3542	.8010	12
		Total	5.3942	1.1094	26
	Total	.00	5.6161	1.2738	28
		1.00	5.6042	.8782	24
		Total	5.6106	1.0986	52
1.00	.00	.00	4.0208	1.4903	12
		1.00	4.4375	1.0825	12
		Total	4.2292	1.2915	24
	1.00	.00	4.1250	1.2903	12
		1.00	4.2500	1.7645	12
		Total	4.1875	1.5131	24
	Total	.00	4.0729	1.3643	24
		1.00	4.3438	1.4348	24
		Total	4.2083	1.3918	48
2.00	.00	.00	4.6458	1.5756	12
		1.00	4.1042	1.3334	12
		Total	4.3750	1.4540	24
	1.00	.00	3.4250	.8744	10
		1.00	4.0179	1.2108	14
		Total	3.7708	1.1031	24
	Total	.00	4.0909	1.4196	22
		1.00	4.0577	1.2436	26
		Total	4.0729	1.3127	48
Total	.00	.00	4.8750	1.5798	38
		1.00	4.7986	1.3347	36
		Total	4.8378	1.4562	74
	1.00	.00	4.4375	1.4545	36
		1.00	4.5132	1.4058	38
		Total	4.4764	1.4204	74
	Total	.00	4.6622	1.5257	74
		1.00	4.6520	1.3698	74
		Total	4.6571	1.4449	148

Descriptive Statistics
Dependent Variable: FNEUTRA

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	5.8036	1.2136	14
		1.00	5.8542	.9136	12
		Total	5.8269	1.0648	26
	1.00	.00	4.0208	1.4903	12
		1.00	4.4375	1.0825	12
		Total	4.2292	1.2915	24
	2.00	.00	4.6458	1.5756	12
		1.00	4.1042	1.3334	12
		Total	4.3750	1.4540	24
	Total	.00	4.8750	1.5798	38
		1.00	4.7986	1.3347	36
		Total	4.8378	1.4562	74
1.00	.00	.00	5.4286	1.3496	14
		1.00	5.3542	.8010	12
		Total	5.3942	1.1094	26
	1.00	.00	4.1250	1.2903	12
		1.00	4.2500	1.7645	12
		Total	4.1875	1.5131	24
	2.00	.00	3.4250	.8744	10
		1.00	4.0179	1.2108	14
		Total	3.7708	1.1031	24
	Total	.00	4.4375	1.4545	36
		1.00	4.5132	1.4058	38
		Total	4.4764	1.4204	74
Total	.00	.00	5.6161	1.2738	28
		1.00	5.6042	.8782	24
		Total	5.6106	1.0986	52
	1.00	.00	4.0729	1.3643	24
		1.00	4.3438	1.4348	24
		Total	4.2083	1.3918	48
	2.00	.00	4.0909	1.4196	22
		1.00	4.0577	1.2436	26
		Total	4.0729	1.3127	48
	Total	.00	4.6622	1.5257	74
		1.00	4.6520	1.3698	74
		Total	4.6571	1.4449	148

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			FNEUTRA
Level 1 vs. Later	Contrast Estimate		1.470
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		1.470
	Std. Error		.218
	Sig.		.000
	95% Confidence Interval for Difference	Lower Bound	1.040
		Upper Bound	1.900
Level 2 vs. Level 3	Contrast Estimate		.135
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.135
	Std. Error		.258
	Sig.		.600
	95% Confidence Interval for Difference	Lower Bound	-.374
		Upper Bound	.645

Test Results

Dependent Variable: FNEUTRA

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	73.322	2	36.661	22.958	.000	.244	45.916	1.000
Error	226.753	142	1.597					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: FNEUTRA
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	1.4022(*)	.2529	.000	.7895	2.0150
	2.00	1.5377(*)	.2529	.000	.9249	2.1504
1.00	.00	-1.4022(*)	.2529	.000	-2.0150	-.7895
	2.00	.1354	.2579	1.000	-.4895	.7603
2.00	.00	-1.5377(*)	.2529	.000	-2.1504	-.9249
	1.00	-.1354	.2579	1.000	-.7603	.4895

Based on observed means.

* The mean difference is significant at the .05 level.

4.3.2 Power

Tests of Between-Subjects Effects
Dependent Variable: POWER

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	22.796(b)	11	2.072	1.734	.072	.123	19.076	.827
Intercept	4539.405	1	4539.405	3798.601	.000	.965	3798.601	1.000
ALIGN	7.014	2	3.507	2.934	.057	.041	5.869	.564
LOCATION	4.585	1	4.585	3.837	.052	.027	3.837	.494
VIDEO	.505	1	.505	.423	.517	.003	.423	.099
ALIGN * LOCATION	.918	2	.459	.384	.682	.006	.768	.111
ALIGN * VIDEO	1.149	2	.574	.481	.619	.007	.961	.127
LOCATION * VIDEO	6.230	1	6.230	5.213	.024	.037	5.213	.621
ALIGN * LOCATION * VIDEO	3.966	2	1.983	1.659	.194	.024	3.319	.345
Error	162.523	136	1.195					
Total	4800.875	148						
Corrected Total	185.319	147						

a Computed using alpha = .05

b R Squared = .123 (Adjusted R Squared = .052)

Descriptive Statistics
Dependent Variable: POWER

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.1964	.7856	14
		1.00	6.0625	1.0773	12
		Total	6.1346	.9144	26
	1.00	.00	5.6250	1.4536	14
		1.00	5.5000	1.3858	12
		Total	5.5673	1.3956	26
	Total	.00	5.9107	1.1829	28
		1.00	5.7813	1.2474	24
		Total	5.8510	1.2028	52
1.00	.00	.00	5.7083	.6728	12
		1.00	5.5208	.8948	12
		Total	5.6146	.7801	24
	1.00	.00	5.0833	1.2939	12
		1.00	5.7500	.6908	12
		Total	5.4167	1.0700	24
	Total	.00	5.3958	1.0579	24
		1.00	5.6354	.7905	24
		Total	5.5156	.9317	48
2.00	.00	.00	5.7500	1.1531	12
		1.00	5.1875	1.2300	12
		Total	5.4688	1.2008	24
	1.00	.00	4.6500	1.1972	10
		1.00	5.6964	.9415	14
		Total	5.2604	1.1574	24
	Total	.00	5.2500	1.2748	22
		1.00	5.4615	1.0925	26
		Total	5.3646	1.1714	48
Total	.00	.00	5.9013	.8939	38
		1.00	5.5903	1.1070	36
		Total	5.7500	1.0085	74
	1.00	.00	5.1736	1.3573	36
		1.00	5.6513	1.0176	38
		Total	5.4189	1.2108	74
	Total	.00	5.5473	1.1926	74
		1.00	5.6216	1.0552	74
		Total	5.5845	1.1228	148

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			POWER
Level 1 vs. Later	Contrast Estimate		.411
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.411
	Std. Error		.191
	Sig.		.033
	95% Confidence Interval for Difference	Lower Bound	3.418E-02
		Upper Bound	.788
Level 2 vs. Level 3	Contrast Estimate		.151
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.151
	Std. Error		.226
	Sig.		.505
	95% Confidence Interval for Difference	Lower Bound	-.296
		Upper Bound	.598

Test Results
Dependent Variable: POWER

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	6.241	2	3.121	2.548	.082	.035	5.096	.503
Error	173.903	142	1.225					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: POWER
Bonferroni

					95% Confidence Interval	
(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	.3353	.2215	.397	-.2013	.8720
	2.00	.4864	.2215	.089	-5.0261E-02	1.0230
1.00	.00	-.3353	.2215	.397	-.8720	.2013
	2.00	.1510	.2259	1.000	-.3962	.6983
2.00	.00	-.4864	.2215	.089	-1.0230	5.026E-02
	1.00	-.1510	.2259	1.000	-.6983	.3962

Based on observed means.

4.3.2 Power Without Video

Tests of Between-Subjects Effects
Dependent Variable: POWER

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	17.423(b)	5	3.485	2.742	.026	.168	13.710	.793
Intercept	2211.319	1	2211.319	1740.150	.000	.962	1740.150	1.000
ALIGN	6.866	2	3.433	2.701	.074	.074	5.403	.518
LOCATION	10.700	1	10.700	8.420	.005	.110	8.420	.816
ALIGN * LOCATION	.985	2	.492	.387	.680	.011	.775	.110
Error	86.412	68	1.271					
Total	2381.000	74						
Corrected Total	103.834	73						

a Computed using alpha = .05

b R Squared = .168 (Adjusted R Squared = .107)

Descriptive Statistics
Dependent Variable: POWER

ALIGN	LOCATION	Mean	Std. Deviation	N
.00	.00	6.1964	.7856	14
	1.00	5.6250	1.4536	14
	Total	5.9107	1.1829	28
1.00	.00	5.7083	.6728	12
	1.00	5.0833	1.2939	12
	Total	5.3958	1.0579	24
2.00	.00	5.7500	1.1531	12
	1.00	4.6500	1.1972	10
	Total	5.2500	1.2748	22
Total	.00	5.9013	.8939	38
	1.00	5.1736	1.3573	36
	Total	5.5473	1.1926	74

Descriptive Statistics
Dependent Variable: POWER

LOCATION	ALIGN	Mean	Std. Deviation	N
.00	.00	6.1964	.7856	14
	1.00	5.7083	.6728	12
	2.00	5.7500	1.1531	12
	Total	5.9013	.8939	38
1.00	.00	5.6250	1.4536	14
	1.00	5.0833	1.2939	12
	2.00	4.6500	1.1972	10
	Total	5.1736	1.3573	36
Total	.00	5.9107	1.1829	28
	1.00	5.3958	1.0579	24
	2.00	5.2500	1.2748	22
	Total	5.5473	1.1926	74

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			POWER
Level 1 vs. Later	Contrast Estimate		.613
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.613
	Std. Error		.271
	Sig.		.027
	95% Confidence Interval for Difference	Lower Bound	7.298E-02
		Upper Bound	1.153
Level 2 vs. Level 3	Contrast Estimate		.196
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.196
	Std. Error		.333
	Sig.		.559
	95% Confidence Interval for Difference	Lower Bound	-.470
		Upper Bound	.861

Test Results
Dependent Variable: POWER

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	6.866	2	3.433	2.701	.074	.074	5.403	.518
Error	86.412	68	1.271					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: POWER
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	.5149	.3136	.316	-.2548	1.2846
	2.00	.6607	.3212	.131	-.1276	1.4491
1.00	.00	-.5149	.3136	.316	-1.2846	.2548
	2.00	.1458	.3327	1.000	-.6709	.9626
2.00	.00	-.6607	.3212	.131	-1.4491	.1276
	1.00	-.1458	.3327	1.000	-.9626	.6709

Based on observed means.

4.3.2 Power With Video

Tests of Between-Subjects Effects
Dependent Variable: POWER

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	5.170(b)	5	1.034	.924	.471	.064	4.619	.310
Intercept	2329.164	1	2329.164	2080.953	.000	.968	2080.953	1.000
ALIGN	1.447	2	.724	.646	.527	.019	1.293	.154
LOCATION	6.317E-02	1	6.317E-02	.056	.813	.001	.056	.056
ALIGN * LOCATION	3.797	2	1.899	1.696	.191	.048	3.393	.345
Error	76.111	68	1.119					
Total	2419.875	74						
Corrected Total	81.280	73						

a Computed using alpha = .05

b R Squared = .064 (Adjusted R Squared = -.005)

Descriptive Statistics
Dependent Variable: POWER

ALIGN	LOCATION	Mean	Std. Deviation	N
.00	.00	6.0625	1.0773	12
	1.00	5.5000	1.3858	12
	Total	5.7813	1.2474	24
1.00	.00	5.5208	.8948	12
	1.00	5.7500	.6908	12
	Total	5.6354	.7905	24
2.00	.00	5.1875	1.2300	12
	1.00	5.6964	.9415	14
	Total	5.4615	1.0925	26
Total	.00	5.5903	1.1070	36
	1.00	5.6513	1.0176	38
	Total	5.6216	1.0552	74

Descriptive Statistics
Dependent Variable: POWER

LOCATION	ALIGN	Mean	Std. Deviation	N
.00	.00	6.0625	1.0773	12
	1.00	5.5208	.8948	12
	2.00	5.1875	1.2300	12
	Total	5.5903	1.1070	36
1.00	.00	5.5000	1.3858	12
	1.00	5.7500	.6908	12
	2.00	5.6964	.9415	14
	Total	5.6513	1.0176	38
Total	.00	5.7813	1.2474	24
	1.00	5.6354	.7905	24
	2.00	5.4615	1.0925	26
	Total	5.6216	1.0552	74

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			POWER
Level 1 vs. Later	Contrast Estimate		.243
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.243
	Std. Error		.263
	Sig.		.359
	95% Confidence Interval for Difference	Lower Bound	-.282
		Upper Bound	.767
Level 2 vs. Level 3	Contrast Estimate		.193
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.193
	Std. Error		.300
	Sig.		.521
	95% Confidence Interval for Difference	Lower Bound	-.405
		Upper Bound	.792

Test Results
Dependent Variable: POWER

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	1.447	2	.724	.646	.527	.019	1.293	.154
Error	76.111	68	1.119					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: POWER
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	.1458	.3054	1.000	-.6038	.8955
	2.00	.3197	.2995	.868	-.4154	1.0548
1.00	.00	-.1458	.3054	1.000	-.8955	.6038
	2.00	.1739	.2995	1.000	-.5612	.9090
2.00	.00	-.3197	.2995	.868	-1.0548	.4154
	1.00	-.1739	.2995	1.000	-.9090	.5612

Based on observed means.

4.3.3 Group Synergy

Tests of Between-Subjects Effects
Dependent Variable: GRPSYN

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	17.035(b)	11	1.549	2.519	.006	.170	27.705	.956
Intercept	5876.794	1	5876.794	9557.865	.000	.986	9557.865	1.000
ALIGN	.146	2	7.313E-02	.119	.888	.002	.238	.068
LOCATION	5.977E-02	1	5.977E-02	.097	.756	.001	.097	.061
VIDEO	.470	1	.470	.765	.383	.006	.765	.140
ALIGN * LOCATION	2.194	2	1.097	1.784	.172	.026	3.568	.368
ALIGN * VIDEO	8.139	2	4.070	6.619	.002	.089	13.238	.907
LOCATION * VIDEO	.934	1	.934	1.519	.220	.011	1.519	.232
ALIGN * LOCATION * VIDEO	5.683	2	2.841	4.621	.011	.064	9.242	.773
Error	83.007	135	.615					
Total	6063.063	147						
Corrected Total	100.042	146						

a Computed using alpha = .05

b R Squared = .170 (Adjusted R Squared = .103)

4.3.3 Group Synergy Without Video

Tests of Between-Subjects Effects Dependent Variable: GRPSYN

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	6.888(a)	5	1.378	2.625	.031	.162
Intercept	2999.750	1	2999.750	5717.408	.000	.988
ALIGN	4.853	2	2.426	4.624	.013	.120
LOCATION	.261	1	.261	.498	.483	.007
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	2.281	2	1.141	2.174	.122	.060
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	35.678	68	.525			
Total	3101.188	74				
Corrected Total	42.565	73				

a R Squared = .162 (Adjusted R Squared = .100)

Descriptive Statistics :Dependent Variable: GRPSYN

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.3214	1.0850	14
		Total	6.3214	1.0850	14
	1.00	.00	6.6250	.4573	14
		Total	6.6250	.4573	14
	Total	.00	6.4732	.8315	28
		Total	6.4732	.8315	28
1.00	.00	.00	6.7500	.3844	12
		Total	6.7500	.3844	12
	1.00	.00	6.6458	.4580	12
		Total	6.6458	.4580	12
	Total	.00	6.6979	.4169	24
		Total	6.6979	.4169	24
2.00	.00	.00	6.3333	.7858	12
		Total	6.3333	.7858	12
	1.00	.00	5.7750	.8776	10
		Total	5.7750	.8776	10
	Total	.00	6.0795	.8570	22
		Total	6.0795	.8570	22
Total	.00	.00	6.4605	.8251	38
		Total	6.4605	.8251	38
	1.00	.00	6.3958	.7030	36
		Total	6.3958	.7030	36
	Total	.00	6.4291	.7636	74
		Total	6.4291	.7636	74

Descriptive Statistics: Dependent Variable: GRPSYN

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.3214	1.0850	14
		Total	6.3214	1.0850	14
	1.00	.00	6.7500	.3844	12
		Total	6.7500	.3844	12
	2.00	.00	6.3333	.7858	12
		Total	6.3333	.7858	12
	Total	.00	6.4605	.8251	38
		Total	6.4605	.8251	38
1.00	.00	.00	6.6250	.4573	14
		Total	6.6250	.4573	14
	1.00	.00	6.6458	.4580	12
		Total	6.6458	.4580	12
	2.00	.00	5.7750	.8776	10
		Total	5.7750	.8776	10
	Total	.00	6.3958	.7030	36
		Total	6.3958	.7030	36
Total	.00	.00	6.4732	.8315	28
		Total	6.4732	.8315	28
	1.00	.00	6.6979	.4169	24
		Total	6.6979	.4169	24
	2.00	.00	6.0795	.8570	22
		Total	6.0795	.8570	22
	Total	.00	6.4291	.7636	74
		Total	6.4291	.7636	74

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			GRPSYN
Level 1 vs. Later	Contrast Estimate		9.717E-02
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		9.717E-02
	Std. Error		.174
	Sig.		.578
	95% Confidence Interval for Difference	Lower Bound	-.250
		Upper Bound	.444
Level 2 vs. Level 3	Contrast Estimate		.644
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.644
	Std. Error		.214
	Sig.		.004
	95% Confidence Interval for Difference	Lower Bound	.216
		Upper Bound	1.071

Test Results
Dependent Variable: GRPSYN

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	4.853	2	2.426	4.624	.013	.120	9.249	.763
Error	35.678	68	.525					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: GRPSYN
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	-.2247	.2015	.806	-.7193	.2699
	2.00	.3937	.2064	.182	-.1129	.9002
1.00	.00	.2247	.2015	.806	-.2699	.7193
	2.00	.6184(*)	.2138	.015	9.357E-02	1.1432
2.00	.00	-.3937	.2064	.182	-.9002	.1129
	1.00	-.6184(*)	.2138	.015	-1.1432	-9.3571E-02

Based on observed means.

* The mean difference is significant at the .05 level.

4.3.3 Group Synergy With Video

Tests of Between-Subjects Effects Dependent Variable: GRPSYN

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	9.611(a)	5	1.922	2.721	.027	.169
Intercept	2877.861	1	2877.861	4073.947	.000	.984
ALIGN	3.349	2	1.674	2.370	.101	.066
LOCATION	.731	1	.731	1.035	.313	.015
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	5.350	2	2.675	3.787	.028	.102
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	47.329	67	.706			
Total	2961.875	73				
Corrected Total	56.940	72				
a R Squared = .169 (Adjusted R Squared = .107)						

Descriptive Statistics: Dependent Variable: GRPSYN

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.5208	.4454	12
		Total	6.5208	.4454	12
	1.00	1.00	6.0455	1.4867	11
		Total	6.0455	1.4867	11
	Total	1.00	6.2935	1.0783	23
		Total	6.2935	1.0783	23
1.00	.00	1.00	5.6042	1.2222	12
		Total	5.6042	1.2222	12
	1.00	1.00	6.4792	.4580	12
		Total	6.4792	.4580	12
	Total	1.00	6.0417	1.0072	24
		Total	6.0417	1.0072	24
2.00	.00	1.00	6.4583	.4981	12
		Total	6.4583	.4981	12
	1.00	1.00	6.6607	.3482	14
		Total	6.6607	.3482	14
	Total	1.00	6.5673	.4275	26
		Total	6.5673	.4275	26
Total	.00	1.00	6.1944	.8886	36
		Total	6.1944	.8886	36
	1.00	1.00	6.4189	.8879	37
		Total	6.4189	.8879	37
	Total	1.00	6.3082	.8893	73
		Total	6.3082	.8893	73

Descriptive Statistics: Dependent Variable: GRPSYN

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.5208	.4454	12
		Total	6.5208	.4454	12
	1.00	1.00	5.6042	1.2222	12
		Total	5.6042	1.2222	12
	2.00	1.00	6.4583	.4981	12
		Total	6.4583	.4981	12
	Total	1.00	6.1944	.8886	36
		Total	6.1944	.8886	36
1.00	.00	1.00	6.0455	1.4867	11
		Total	6.0455	1.4867	11
	1.00	1.00	6.4792	.4580	12
		Total	6.4792	.4580	12
	2.00	1.00	6.6607	.3482	14
		Total	6.6607	.3482	14
	Total	1.00	6.4189	.8879	37
		Total	6.4189	.8879	37
Total	.00	1.00	6.2935	1.0783	23
		Total	6.2935	1.0783	23
	1.00	1.00	6.0417	1.0072	24
		Total	6.0417	1.0072	24
	2.00	1.00	6.5673	.4275	26
		Total	6.5673	.4275	26
	Total	1.00	6.3082	.8893	73
		Total	6.3082	.8893	73

4.3.3 Group Synergy With Video Distributed

Tests of Between-Subjects Effects
Dependent Variable: GRPSYN

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	6.295(a)	2	3.148	4.867	.014	.228
Intercept	1381.361	1	1381.361	2135.750	.000	.985
ALIGN	6.295	2	3.148	4.867	.014	.228
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	21.344	33	.647			
Total	1409.000	36				
Corrected Total	27.639	35				

a R Squared = .228 (Adjusted R Squared = .181)

Descriptive Statistics
Dependent Variable: GRPSYN

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.5208	.4454	12
		Total	6.5208	.4454	12
	Total	1.00	6.5208	.4454	12
		Total	6.5208	.4454	12
1.00	.00	1.00	5.6042	1.2222	12
		Total	5.6042	1.2222	12
	Total	1.00	5.6042	1.2222	12
		Total	5.6042	1.2222	12
2.00	.00	1.00	6.4583	.4981	12
		Total	6.4583	.4981	12
	Total	1.00	6.4583	.4981	12
		Total	6.4583	.4981	12
Total	.00	1.00	6.1944	.8886	36
		Total	6.1944	.8886	36
	Total	1.00	6.1944	.8886	36
		Total	6.1944	.8886	36

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			GRPSYN
Level 1 vs. Later	Contrast Estimate		.490
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.490
	Std. Error		.284
	Sig.		.094
	95% Confidence Interval for Difference	Lower Bound	-8.890E-02
		Upper Bound	1.068
Level 2 vs. Level 3	Contrast Estimate		-.854
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-.854
	Std. Error		.328
	Sig.		.014
	95% Confidence Interval for Difference	Lower Bound	-1.522
		Upper Bound	-.186

Test Results
Dependent Variable: GRPSYN

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	6.295	2	3.148	4.867	.014	.228	9.733	.765
Error	21.344	33	.647					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: GRPSYN
Bonferroni

					95% Confidence Interval	
(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	.9167(*)	.3283	.026	8.856E-02	1.7448
	2.00	6.250E-02	.3283	1.000	-.7656	.8906
1.00	.00	-.9167(*)	.3283	.026	-1.7448	-8.8563E-02
	2.00	-.8542(*)	.3283	.041	-1.6823	-2.6063E-02
2.00	.00	-6.2500E-02	.3283	1.000	-.8906	.7656
	1.00	.8542(*)	.3283	.041	2.606E-02	1.6823

Based on observed means.

* The mean difference is significant at the .05 level.

4.3.3 Group Synergy With Video Co-Located

Tests of Between-Subjects Effects
Dependent Variable: GRPSYN

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2.396(a)	2	1.198	1.568	.223	.084
Intercept	1498.252	1	1498.252	1960.349	.000	.983
ALIGN	2.396	2	1.198	1.568	.223	.084
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	25.985	34	.764			
Total	1552.875	37				
Corrected Total	28.382	36				

a R Squared = .084 (Adjusted R Squared = .031)

Descriptive Statistics
Dependent Variable: GRPSYN

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	1.00	1.00	6.0455	1.4867	11
		Total	6.0455	1.4867	11
	Total	1.00	6.0455	1.4867	11
		Total	6.0455	1.4867	11
1.00	1.00	1.00	6.4792	.4580	12
		Total	6.4792	.4580	12
	Total	1.00	6.4792	.4580	12
		Total	6.4792	.4580	12
2.00	1.00	1.00	6.6607	.3482	14
		Total	6.6607	.3482	14
	Total	1.00	6.6607	.3482	14
		Total	6.6607	.3482	14
Total	1.00	1.00	6.4189	.8879	37
		Total	6.4189	.8879	37
	Total	1.00	6.4189	.8879	37
		Total	6.4189	.8879	37

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			GRPSYN
Level 1 vs. Later	Contrast Estimate		-.524
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-.524
	Std. Error		.315
	Sig.		.105
	95% Confidence Interval for Difference	Lower Bound	-1.164
		Upper Bound	.115
Level 2 vs. Level 3	Contrast Estimate		-.182
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-.182
	Std. Error		.344
	Sig.		.601
	95% Confidence Interval for Difference	Lower Bound	-.880
		Upper Bound	.517

Test Results
Dependent Variable: GRPSYN

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	2.396	2	1.198	1.568	.223	.084	3.135	.309
Error	25.985	34	.764					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: GRPSYN
Bonferroni

					95% Confidence Interval	
(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	-.4337	.3649	.729	-1.3527	.4853
	2.00	-.6153	.3522	.269	-1.5023	.2718
1.00	.00	.4337	.3649	.729	-.4853	1.3527
	2.00	-.1815	.3439	1.000	-1.0476	.6845
2.00	.00	.6153	.3522	.269	-.2718	1.5023
	1.00	.1815	.3439	1.000	-.6845	1.0476

Based on observed means.

4.3.4 GSS Fairness

Tests of Between-Subjects Effects
Dependent Variable: GSSFAIR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	73.320(b)	11	6.665	4.640	.000	.274	51.042	1.000
Intercept	4115.205	1	4115.205	2864.812	.000	.955	2864.812	1.000
ALIGN	15.430	2	7.715	5.371	.006	.074	10.742	.835
LOCATION	31.615	1	31.615	22.009	.000	.140	22.009	.997
VIDEO	7.361	1	7.361	5.124	.025	.037	5.124	.613
ALIGN * LOCATION	5.406	2	2.703	1.882	.156	.027	3.764	.386
ALIGN * VIDEO	.601	2	.300	.209	.812	.003	.418	.082
LOCATION * VIDEO	10.099	1	10.099	7.031	.009	.050	7.031	.749
ALIGN * LOCATION * VIDEO	9.966	2	4.983	3.469	.034	.049	6.938	.641
Error	193.923	135	1.436					
Total	4459.250	147						
Corrected Total	267.243	146						

a Computed using alpha = .05

b R Squared = .274 (Adjusted R Squared = .215)

4.3.4 GSS Fairness Without Video

Tests of Between-Subjects Effects Dependent Variable: GSSFAIR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	56.283(a)	5	11.257	7.194	.000	.346
Intercept	1892.624	1	1892.624	1209.619	.000	.947
ALIGN	11.458	2	5.729	3.662	.031	.097
LOCATION	38.836	1	38.836	24.821	.000	.267
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	9.488	2	4.744	3.032	.055	.082
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	106.396	68	1.565			
Total	2134.625	74				
Corrected Total	162.679	73				

a R Squared = .346 (Adjusted R Squared = .298)

Descriptive Statistics: Dependent Variable: GSSFAIR

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.2500	.6124	14
		Total	6.2500	.6124	14
	1.00	.00	5.0000	1.5411	14
		Total	5.0000	1.5411	14
	Total	.00	5.6250	1.3150	28
		Total	5.6250	1.3150	28
1.00	.00	.00	5.2500	1.2107	12
		Total	5.2500	1.2107	12
	1.00	.00	4.5833	1.3456	12
		Total	4.5833	1.3456	12
	Total	.00	4.9167	1.2973	24
		Total	4.9167	1.2973	24
2.00	.00	.00	5.9583	1.2193	12
		Total	5.9583	1.2193	12
	1.00	.00	3.5000	1.4240	10
		Total	3.5000	1.4240	10
	Total	.00	4.8409	1.7937	22
		Total	4.8409	1.7937	22
Total	.00	.00	5.8421	1.0912	38
		Total	5.8421	1.0912	38
	1.00	.00	4.4444	1.5354	36
		Total	4.4444	1.5354	36
	Total	.00	5.1622	1.4928	74
		Total	5.1622	1.4928	74

Descriptive Statistics
Dependent Variable: GSSFAIR

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.2500	.6124	14
		Total	6.2500	.6124	14
	1.00	.00	5.2500	1.2107	12
		Total	5.2500	1.2107	12
	2.00	.00	5.9583	1.2193	12
		Total	5.9583	1.2193	12
	Total	.00	5.8421	1.0912	38
		Total	5.8421	1.0912	38
1.00	.00	.00	5.0000	1.5411	14
		Total	5.0000	1.5411	14
	1.00	.00	4.5833	1.3456	12
		Total	4.5833	1.3456	12
	2.00	.00	3.5000	1.4240	10
		Total	3.5000	1.4240	10
	Total	.00	4.4444	1.5354	36
		Total	4.4444	1.5354	36
Total	.00	.00	5.6250	1.3150	28
		Total	5.6250	1.3150	28
	1.00	.00	4.9167	1.2973	24
		Total	4.9167	1.2973	24
	2.00	.00	4.8409	1.7937	22
		Total	4.8409	1.7937	22
	Total	.00	5.1622	1.4928	74
		Total	5.1622	1.4928	74

4.3.4 GSS Fair Without Video Distributed

Tests of Between-Subjects Effects
Dependent Variable: GSSFAIR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	6.698(b)	2	3.349	3.138	.056	.152	6.276	.565
Intercept	1280.132	1	1280.132	1199.455	.000	.972	1199.455	1.000
ALIGN	6.698	2	3.349	3.138	.056	.152	6.276	.565
LOCATION	.000	0	.	.	.	.000	.000	.
ALIGN * LOCATION	.000	0	.	.	.	.000	.000	.
Error	37.354	35	1.067					
Total	1341.000	38						
Corrected Total	44.053	37						

a Computed using alpha = .05

b R Squared = .152 (Adjusted R Squared = .104)

Descriptive Statistics
Dependent Variable: GSSFAIR

ALIGN	LOCATION	Mean	Std. Deviation	N
.00	.00	6.2500	.6124	14
	Total	6.2500	.6124	14
1.00	.00	5.2500	1.2107	12
	Total	5.2500	1.2107	12
2.00	.00	5.9583	1.2193	12
	Total	5.9583	1.2193	12
Total	.00	5.8421	1.0912	38
	Total	5.8421	1.0912	38

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			GSSFAIR
Level 1 vs. Later	Contrast Estimate		.646
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.646
	Std. Error		.347
	Sig.		.071
	95% Confidence Interval for Difference	Lower Bound	-5.947E-02
		Upper Bound	1.351
Level 2 vs. Level 3	Contrast Estimate		-.708
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-.708
	Std. Error		.422
	Sig.		.102
	95% Confidence Interval for Difference	Lower Bound	-1.565
		Upper Bound	.148

Test Results
Dependent Variable: GSSFAIR

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	6.698	2	3.349	3.138	.056	.152	6.276	.565
Error	37.354	35	1.067					
a Computed using alpha = .05								

Multiple Comparisons
Dependent Variable: GSSFAIR
Bonferroni

					95% Confidence Interval	
(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	1.0000	.4064	.057	-2.1942E-02	2.0219
	2.00	.2917	.4064	1.000	-.7303	1.3136
1.00	.00	-1.0000	.4064	.057	-2.0219	2.194E-02
	2.00	-.7083	.4218	.306	-1.7689	.3522
2.00	.00	-.2917	.4064	1.000	-1.3136	.7303
	1.00	.7083	.4218	.306	-.3522	1.7689
Based on observed means.						

4.3.4 GSS Fair Without Video Co-Located

Tests of Between-Subjects Effects
Dependent Variable: GSSFAIR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	13.472(b)	2	6.736	3.220	.053	.163	6.439	.575
Intercept	671.896	1	671.896	321.148	.000	.907	321.148	1.000
ALIGN	13.472	2	6.736	3.220	.053	.163	6.439	.575
LOCATION	.000	0	.	.	.	.000	.000	.
ALIGN * LOCATION	.000	0	.	.	.	.000	.000	.
Error	69.042	33	2.092					
Total	793.625	36						
Corrected Total	82.514	35						

a Computed using alpha = .05

b R Squared = .163 (Adjusted R Squared = .113)

Descriptive Statistics
Dependent Variable: GSSFAIR

ALIGN	LOCATION	Mean	Std. Deviation	N
.00	1.00	5.0000	1.5411	14
	Total	5.0000	1.5411	14
1.00	1.00	4.5833	1.3456	12
	Total	4.5833	1.3456	12
2.00	1.00	3.5000	1.4240	10
	Total	3.5000	1.4240	10
Total	1.00	4.4444	1.5354	36
	Total	4.4444	1.5354	36

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			GSSFAIR
Level 1 vs. Later	Contrast Estimate		.958
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.958
	Std. Error		.495
	Sig.		.062
	95% Confidence Interval for Difference	Lower Bound	-4.938E-02
		Upper Bound	1.966
Level 2 vs. Level 3	Contrast Estimate		1.083
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		1.083
	Std. Error		.619
	Sig.		.090
	95% Confidence Interval for Difference	Lower Bound	-.177
		Upper Bound	2.343

Test Results
Dependent Variable: GSSFAIR

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	13.472	2	6.736	3.220	.053	.163	6.439	.575
Error	69.042	33	2.092					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: GSSFAIR
Bonferroni

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) ALIGN	(J) ALIGN				Lower Bound	Upper Bound
.00	1.00	.4167	.5690	1.000	-1.0185	1.8519
	2.00	1.5000	.5989	.052	-1.0504E-02	3.0105
1.00	.00	-.4167	.5690	1.000	-1.8519	1.0185
	2.00	1.0833	.6193	.269	-.4787	2.6454
2.00	.00	-1.5000	.5989	.052	-3.0105	1.050E-02
	1.00	-1.0833	.6193	.269	-2.6454	.4787

Based on observed means.

4.3.4 GSS Fair With Video

Tests of Between-Subjects Effects Dependent Variable: GSSFAIR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	12.317(a)	5	2.463	1.886	.108	.123
Intercept	2228.984	1	2228.984	1706.238	.000	.962
ALIGN	4.875	2	2.438	1.866	.163	.053
LOCATION	2.980	1	2.980	2.281	.136	.033
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	5.206	2	2.603	1.992	.144	.056
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	87.527	67	1.306			
Total	2324.625	73				
Corrected Total	99.844	72				

a R Squared = .123 (Adjusted R Squared = .058)

Descriptive Statistics: Dependent Variable: GSSFAIR

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.4773	.4251	11
		Total	6.4773	.4251	11
	1.00	1.00	5.3125	1.0287	12
		Total	5.3125	1.0287	12
	Total	1.00	5.8696	.9824	23
		Total	5.8696	.9824	23
1.00	.00	1.00	5.5000	.8528	12
		Total	5.5000	.8528	12
	1.00	1.00	5.3958	1.4161	12
		Total	5.3958	1.4161	12
	Total	1.00	5.4479	1.1444	24
		Total	5.4479	1.1444	24
2.00	.00	1.00	5.2500	1.4655	12
		Total	5.2500	1.4655	12
	1.00	1.00	5.3036	1.2526	14
		Total	5.3036	1.2526	14
	Total	1.00	5.2788	1.3273	26
		Total	5.2788	1.3273	26
Total	.00	1.00	5.7214	1.1242	35
		Total	5.7214	1.1242	35
	1.00	1.00	5.3355	1.2099	38
		Total	5.3355	1.2099	38
	Total	1.00	5.5205	1.1776	73
		Total	5.5205	1.1776	73

Descriptive Statistics: Dependent Variable: GSSFAIR

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.4773	.4251	11
		Total	6.4773	.4251	11
	1.00	1.00	5.5000	.8528	12
		Total	5.5000	.8528	12
	2.00	1.00	5.2500	1.4655	12
		Total	5.2500	1.4655	12
	Total	1.00	5.7214	1.1242	35
		Total	5.7214	1.1242	35
1.00	.00	1.00	5.3125	1.0287	12
		Total	5.3125	1.0287	12
	1.00	1.00	5.3958	1.4161	12
		Total	5.3958	1.4161	12
	2.00	1.00	5.3036	1.2526	14
		Total	5.3036	1.2526	14
	Total	1.00	5.3355	1.2099	38
		Total	5.3355	1.2099	38
Total	.00	1.00	5.8696	.9824	23
		Total	5.8696	.9824	23
	1.00	1.00	5.4479	1.1444	24
		Total	5.4479	1.1444	24
	2.00	1.00	5.2788	1.3273	26
		Total	5.2788	1.3273	26
	Total	1.00	5.5205	1.1776	73
		Total	5.5205	1.1776	73

4.4.1 Facilitator Satisfaction

Tests of Between-Subjects Effects
Dependent Variable: FACSAT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Corrected Model	9.997(b)	11	.909	.948	.497	.071	10.430	.509
Intercept	5124.590	1	5124.590	5346.348	.000	.975	5346.348	1.000
ALIGN	8.532	2	4.266	4.451	.013	.061	8.901	.756
LOCATION	2.556E-02	1	2.556E-02	.027	.871	.000	.027	.053
VIDEO	5.895E-02	1	5.895E-02	.062	.805	.000	.062	.057
ALIGN * LOCATION	.629	2	.314	.328	.721	.005	.656	.101
ALIGN * VIDEO	.367	2	.183	.191	.826	.003	.383	.079
LOCATION * VIDEO	9.715E-03	1	9.715E-03	.010	.920	.000	.010	.051
ALIGN * LOCATION * VIDEO	.332	2	.166	.173	.841	.003	.346	.076
Error	130.359	136	.959					
Total	5331.250	148						
Corrected Total	140.356	147						

a Computed using alpha = .05

b R Squared = .071 (Adjusted R Squared = -.004)

Descriptive Statistics
Dependent Variable: FACSAT

ALIGN	LOCATION	Mean	Std. Deviation	N
.00	.00	6.1731	1.0903	26
	1.00	6.3269	.5374	26
	Total	6.2500	.8546	52
1.00	.00	5.7708	.7799	24
	1.00	5.7083	1.2061	24
	Total	5.7396	1.0052	48
2.00	.00	5.8229	.9626	24
	1.00	5.6771	1.0516	24
	Total	5.7500	1.0000	48
Total	.00	5.9291	.9612	74
	1.00	5.9155	.9994	74
	Total	5.9223	.9771	148

Contrast Results (K Matrix)

		Dependent Variable
ALIGN Helmert Contrast		FACSAT
Level 1 vs. Later	Contrast Estimate	.505
	Hypothesized Value	0
	Difference (Estimate - Hypothesized)	.505
	Std. Error	.165
	Sig.	.003

	95% Confidence Interval for Difference	Lower Bound	.178
		Upper Bound	.832
Level 2 vs. Level 3	Contrast Estimate		-1.042E-02
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-1.042E-02
	Std. Error		.196
	Sig.		.958
	95% Confidence Interval for Difference	Lower Bound	-.398
		Upper Bound	.377

Test Results
Dependent Variable: FACSAT

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	8.612	2	4.306	4.663	.011	.062	9.325	.777
Error	131.135	142	.923					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: FACSAT
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	.5104(*)	.1924	.027	4.441E-02	.9764
	2.00	.5000(*)	.1924	.031	3.400E-02	.9660
1.00	.00	-.5104(*)	.1924	.027	-.9764	-4.4415E-02
	2.00	-1.0417E-02	.1962	1.000	-.4856	.4648
2.00	.00	-.5000(*)	.1924	.031	-.9660	-3.3998E-02
	1.00	1.042E-02	.1962	1.000	-.4648	.4856

Based on observed means.

* The mean difference is significant at the .05 level.

4.4.2 Utility

Tests of Between-Subjects Effects
Dependent Variable: UTILITY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	7.725(a)	11	.702	1.226	.275	.090
Intercept	5241.496	1	5241.496	9152.552	.000	.985
ALIGN	.457	2	.229	.399	.672	.006
LOCATION	2.731E-02	1	2.731E-02	.048	.827	.000
VIDEO	.124	1	.124	.216	.643	.002
ALIGN * LOCATION	.623	2	.311	.544	.582	.008
ALIGN * VIDEO	1.500	2	.750	1.310	.273	.019
LOCATION * VIDEO	1.452	1	1.452	2.535	.114	.018
ALIGN * LOCATION * VIDEO	3.700	2	1.850	3.230	.043	.045
Error	77.885	136	.573			
Total	5395.625	148				
Corrected Total	85.610	147				

a R Squared = .090 (Adjusted R Squared = .017)

4.4.2 Utility Without Video

Tests of Between-Subjects Effects Dependent Variable: UTILITY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2.648(a)	5	.530	.930	.467	.064
Intercept	2633.480	1	2633.480	4621.598	.000	.985
ALIGN	1.674	2	.837	1.469	.237	.041
LOCATION	.538	1	.538	.944	.335	.014
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.688	2	.344	.604	.550	.017
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	38.748	68	.570			
Total	2726.438	74				
Corrected Total	41.396	73				

a R Squared = .064 (Adjusted R Squared = -.005)

Descriptive Statistics: Dependent Variable: UTILITY

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.1250	.7706	14
		Total	6.1250	.7706	14
	1.00	.00	6.2143	.5175	14
		Total	6.2143	.5175	14
	Total	.00	6.1696	.6457	28
		Total	6.1696	.6457	28
1.00	.00	.00	6.1667	.6337	12
		Total	6.1667	.6337	12
	1.00	.00	5.9167	.9252	12
		Total	5.9167	.9252	12
	Total	.00	6.0417	.7860	24
		Total	6.0417	.7860	24
2.00	.00	.00	5.9792	.9621	12
		Total	5.9792	.9621	12
	1.00	.00	5.6250	.6264	10
		Total	5.6250	.6264	10
	Total	.00	5.8182	.8280	22
		Total	5.8182	.8280	22
Total	.00	.00	6.0921	.7807	38
		Total	6.0921	.7807	38
	1.00	.00	5.9514	.7266	36
		Total	5.9514	.7266	36
	Total	.00	6.0236	.7530	74
		Total	6.0236	.7530	74

Descriptive Statistics
Dependent Variable: UTILITY

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.1250	.7706	14
		Total	6.1250	.7706	14
	1.00	.00	6.1667	.6337	12
		Total	6.1667	.6337	12
	2.00	.00	5.9792	.9621	12
		Total	5.9792	.9621	12
	Total	.00	6.0921	.7807	38
		Total	6.0921	.7807	38
1.00	.00	.00	6.2143	.5175	14
		Total	6.2143	.5175	14
	1.00	.00	5.9167	.9252	12
		Total	5.9167	.9252	12
	2.00	.00	5.6250	.6264	10
		Total	5.6250	.6264	10
	Total	.00	5.9514	.7266	36
		Total	5.9514	.7266	36
Total	.00	.00	6.1696	.6457	28
		Total	6.1696	.6457	28
	1.00	.00	6.0417	.7860	24
		Total	6.0417	.7860	24
	2.00	.00	5.8182	.8280	22
		Total	5.8182	.8280	22
	Total	.00	6.0236	.7530	74
		Total	6.0236	.7530	74

4.4.2 Utility With Video

Tests of Between-Subjects Effects
Dependent Variable: UTILITY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	4.908(a)	5	.982	1.705	.145	.111
Intercept	2608.017	1	2608.017	4531.404	.000	.985
ALIGN	.265	2	.132	.230	.795	.007
LOCATION	.943	1	.943	1.639	.205	.024
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	3.534	2	1.767	3.070	.053	.083
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	39.137	68	.576			
Total	2669.188	74				
Corrected Total	44.045	73				
a R Squared = .111 (Adjusted R Squared = .046)						

4.4.2 Utility With Video Distributed

Tests of Between-Subjects Effects
Dependent Variable: UTILITY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	1.625(a)	2	.813	1.123	.337	.064
Intercept	1225.000	1	1225.000	1693.194	.000	.981
ALIGN	1.625	2	.813	1.123	.337	.064
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	23.875	33	.723			
Total	1250.500	36				
Corrected Total	25.500	35				

a R Squared = .064 (Adjusted R Squared = .007)

Descriptive Statistics
Dependent Variable: UTILITY

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.1250	.7191	12
		Total	6.1250	.7191	12
	Total	1.00	6.1250	.7191	12
		Total	6.1250	.7191	12
1.00	.00	1.00	5.6250	.8223	12
		Total	5.6250	.8223	12
	Total	1.00	5.6250	.8223	12
		Total	5.6250	.8223	12
2.00	.00	1.00	5.7500	.9886	12
		Total	5.7500	.9886	12
	Total	1.00	5.7500	.9886	12
		Total	5.7500	.9886	12
Total	.00	1.00	5.8333	.8536	36
		Total	5.8333	.8536	36
	Total	1.00	5.8333	.8536	36
		Total	5.8333	.8536	36

Multiple Comparisons
Dependent Variable: UTILITY
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	.5000	.3472	.478	-.3758	1.3758
	2.00	.3750	.3472	.864	-.5008	1.2508

1.00	.00	-.5000	.3472	.478	-1.3758	.3758
	2.00	-.1250	.3472	1.000	-1.0008	.7508
2.00	.00	-.3750	.3472	.864	-1.2508	.5008
	1.00	.1250	.3472	1.000	-.7508	1.0008
Based on observed means.						

4.4.2 Utility With Video Co-Located

Tests of Between-Subjects Effects
Dependent Variable: UTILITY

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2.227(a)	2	1.113	2.553	.092	.127
Intercept	1387.934	1	1387.934	3182.937	.000	.989
ALIGN	2.227	2	1.113	2.553	.092	.127
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	15.262	35	.436			
Total	1418.688	38				
Corrected Total	17.488	37				

a R Squared = .127 (Adjusted R Squared = .077)

Descriptive Statistics
Dependent Variable: UTILITY

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	1.00	1.00	5.7292	.8220	12
		Total	5.7292	.8220	12
	Total	1.00	5.7292	.8220	12
		Total	5.7292	.8220	12
1.00	1.00	1.00	6.1458	.5586	12
		Total	6.1458	.5586	12
	Total	1.00	6.1458	.5586	12
		Total	6.1458	.5586	12
2.00	1.00	1.00	6.3036	.5816	14
		Total	6.3036	.5816	14
	Total	1.00	6.3036	.5816	14
		Total	6.3036	.5816	14
Total	1.00	1.00	6.0724	.6875	38
		Total	6.0724	.6875	38
	Total	1.00	6.0724	.6875	38
		Total	6.0724	.6875	38

Contrast Results (K Matrix)

		Dependent Variable
ALIGN Helmert Contrast		UTILITY
Level 1 vs. Later	Contrast Estimate	-.496
	Hypothesized Value	0
	Difference (Estimate - Hypothesized)	-.496

	Std. Error		.231
	Sig.		.039
	95% Confidence Interval for Difference	Lower Bound	-.964
		Upper Bound	-2.725E-02
Level 2 vs. Level 3	Contrast Estimate		-.158
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-.158
	Std. Error		.260
	Sig.		.548
	95% Confidence Interval for Difference	Lower Bound	-.685
		Upper Bound	.370

Test Results
Dependent Variable: UTILITY

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	2.227	2	1.113	2.553	.092	.127	5.106	.477
Error	15.262	35	.436					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: UTILITY
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	-.4167	.2696	.394	-1.0945	.2612
	2.00	-.5744	.2598	.101	-1.2276	7.882E-02
1.00	.00	.4167	.2696	.394	-.2612	1.0945
	2.00	-.1577	.2598	1.000	-.8110	.4955
2.00	.00	.5744	.2598	.101	-7.8818E-02	1.2276
	1.00	.1577	.2598	1.000	-.4955	.8110

Based on observed means.

4.4.3 Group Satisfaction

Tests of Between-Subjects Effects
Dependent Variable: GRPSAT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	11.358(a)	11	1.033	2.299	.013	.157
Intercept	5761.653	1	5761.653	12828.221	.000	.990
ALIGN	1.432	2	.716	1.594	.207	.023
LOCATION	.836	1	.836	1.860	.175	.013
VIDEO	1.782	1	1.782	3.967	.048	.028
ALIGN * LOCATION	1.034	2	.517	1.151	.319	.017
ALIGN * VIDEO	2.565	2	1.282	2.855	.061	.040
LOCATION * VIDEO	2.402	1	2.402	5.349	.022	.038
ALIGN * LOCATION * VIDEO	1.646	2	.823	1.832	.164	.026
Error	61.083	136	.449			
Total	5906.938	148				
Corrected Total	72.440	147				

a R Squared = .157 (Adjusted R Squared = .089)

4.4.3 Group Satisfaction Without Video

Tests of Between-Subjects Effects Dependent Variable: GRPSAT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	4.347(a)	5	.869	3.325	.010	.196
Intercept	2968.625	1	2968.625	11354.009	.000	.994
ALIGN	3.105	2	1.552	5.938	.004	.149
LOCATION	.201	1	.201	.769	.383	.011
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	1.405	2	.702	2.686	.075	.073
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	17.779	68	.261			
Total	3048.688	74				
Corrected Total	22.126	73				

a R Squared = .196 (Adjusted R Squared = .137)

Descriptive Statistics: Dependent Variable: GRPSAT

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.4286	.5999	14
		Total	6.4286	.5999	14
	1.00	.00	6.5179	.4326	14
		Total	6.5179	.4326	14
	Total	.00	6.4732	.5152	28
		Total	6.4732	.5152	28
1.00	.00	.00	6.5208	.3100	12
		Total	6.5208	.3100	12
	1.00	.00	6.6250	.3917	12
		Total	6.6250	.3917	12
	Total	.00	6.5729	.3495	24
		Total	6.5729	.3495	24
2.00	.00	.00	6.3333	.5967	12
		Total	6.3333	.5967	12
	1.00	.00	5.8250	.6672	10
		Total	5.8250	.6672	10
	Total	.00	6.1023	.6666	22
		Total	6.1023	.6666	22
Total	.00	.00	6.4276	.5163	38
		Total	6.4276	.5163	38
	1.00	.00	6.3611	.5899	36
		Total	6.3611	.5899	36
	Total	.00	6.3953	.5505	74
		Total	6.3953	.5505	74

Descriptive Statistics: Dependent Variable: GRPSAT

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.4286	.5999	14
		Total	6.4286	.5999	14
	1.00	.00	6.5208	.3100	12
		Total	6.5208	.3100	12
	2.00	.00	6.3333	.5967	12
		Total	6.3333	.5967	12
	Total	.00	6.4276	.5163	38
		Total	6.4276	.5163	38
1.00	.00	.00	6.5179	.4326	14
		Total	6.5179	.4326	14
	1.00	.00	6.6250	.3917	12
		Total	6.6250	.3917	12
	2.00	.00	5.8250	.6672	10
		Total	5.8250	.6672	10
	Total	.00	6.3611	.5899	36
		Total	6.3611	.5899	36
Total	.00	.00	6.4732	.5152	28
		Total	6.4732	.5152	28
	1.00	.00	6.5729	.3495	24
		Total	6.5729	.3495	24
	2.00	.00	6.1023	.6666	22
		Total	6.1023	.6666	22
	Total	.00	6.3953	.5505	74
		Total	6.3953	.5505	74

4.4.3 Group Satisfaction Without Video Distributed

Tests of Between-Subjects Effects
Dependent Variable: GRPSAT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	.211(a)	2	.105	.382	.685	.021
Intercept	1561.661	1	1561.661	5662.570	.000	.994
ALIGN	.211	2	.105	.382	.685	.021
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	9.653	35	.276			
Total	1579.813	38				
Corrected Total	9.863	37				

a R Squared = .021 (Adjusted R Squared = -.035)

Descriptive Statistics
Dependent Variable: GRPSAT

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.4286	.5999	14
		Total	6.4286	.5999	14
	Total	.00	6.4286	.5999	14
		Total	6.4286	.5999	14
1.00	.00	.00	6.5208	.3100	12
		Total	6.5208	.3100	12
	Total	.00	6.5208	.3100	12
		Total	6.5208	.3100	12
2.00	.00	.00	6.3333	.5967	12
		Total	6.3333	.5967	12
	Total	.00	6.3333	.5967	12
		Total	6.3333	.5967	12
Total	.00	.00	6.4276	.5163	38
		Total	6.4276	.5163	38
	Total	.00	6.4276	.5163	38
		Total	6.4276	.5163	38

Contrast Results (K Matrix)

		Dependent Variable
ALIGN Helmert Contrast		GRPSAT
Level 1 vs. Later	Contrast Estimate	1.488E-03

	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		1.488E-03
	Std. Error		.177
	Sig.		.993
	95% Confidence Interval for Difference	Lower Bound	-.357
		Upper Bound	.360
Level 2 vs. Level 3	Contrast Estimate		.188
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.188
	Std. Error		.214
	Sig.		.388
	95% Confidence Interval for Difference	Lower Bound	-.248
		Upper Bound	.623

Test Results
Dependent Variable: GRPSAT

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	.211	2	.105	.382	.685	.021	.765	.107
Error	9.653	35	.276					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: GRPSAT
Bonferroni

(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
.00	1.00	-9.2262E-02	.2066	1.000	-.6118	.4272
	2.00	9.524E-02	.2066	1.000	-.4243	.6147
1.00	.00	9.226E-02	.2066	1.000	-.4272	.6118
	2.00	.1875	.2144	1.000	-.3516	.7266
2.00	.00	-9.5238E-02	.2066	1.000	-.6147	.4243
	1.00	-.1875	.2144	1.000	-.7266	.3516

Based on observed means.

4.4.3 Group Satisfaction Without Video Co-Located

Tests of Between-Subjects Effects
Dependent Variable: GRPSAT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	4.054(a)	2	2.027	8.230	.001	.333
Intercept	1412.219	1	1412.219	5734.521	.000	.994
ALIGN	4.054	2	2.027	8.230	.001	.333
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	8.127	33	.246			
Total	1468.875	36				
Corrected Total	12.181	35				

a R Squared = .333 (Adjusted R Squared = .292)

Descriptive Statistics
Dependent Variable: GRPSAT

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	1.00	.00	6.5179	.4326	14
		Total	6.5179	.4326	14
	Total	.00	6.5179	.4326	14
		Total	6.5179	.4326	14
1.00	1.00	.00	6.6250	.3917	12
		Total	6.6250	.3917	12
	Total	.00	6.6250	.3917	12
		Total	6.6250	.3917	12
2.00	1.00	.00	5.8250	.6672	10
		Total	5.8250	.6672	10
	Total	.00	5.8250	.6672	10
		Total	5.8250	.6672	10
Total	1.00	.00	6.3611	.5899	36
		Total	6.3611	.5899	36
	Total	.00	6.3611	.5899	36
		Total	6.3611	.5899	36

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			GRPSAT
Level 1 vs. Later	Contrast Estimate		.293
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.293
	Std. Error		.170
	Sig.		.094
	95% Confidence Interval for Difference	Lower Bound	-5.288E-02
		Upper Bound	.639
Level 2 vs. Level 3	Contrast Estimate		.800
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.800
	Std. Error		.212
	Sig.		.001
	95% Confidence Interval for Difference	Lower Bound	.368
		Upper Bound	1.232

Test Results
Dependent Variable: GRPSAT

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	4.054	2	2.027	8.230	.001	.333	16.461	.944
Error	8.127	33	.246					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: GRPSAT
Bonferroni

					95% Confidence Interval	
(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	-.1071	.1952	1.000	-.5995	.3853
	2.00	.6929(*)	.2055	.006	.1746	1.2111
1.00	.00	.1071	.1952	1.000	-.3853	.5995
	2.00	.8000(*)	.2125	.002	.2641	1.3359
2.00	.00	-.6929(*)	.2055	.006	-1.2111	-.1746
	1.00	-.8000(*)	.2125	.002	-1.3359	-.2641

Based on observed means.

* The mean difference is significant at the .05 level.

4.4.3 Group Satisfaction With Video

Tests of Between-Subjects Effects
Dependent Variable: GRPSAT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	5.000(a)	5	1.000	1.570	.180	.104
Intercept	2793.962	1	2793.962	4387.384	.000	.985
ALIGN	.719	2	.360	.565	.571	.016
LOCATION	3.051	1	3.051	4.790	.032	.066
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	1.162	2	.581	.913	.406	.026
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	43.304	68	.637			
Total	2858.250	74				
Corrected Total	48.304	73				

a R Squared = .104 (Adjusted R Squared = .038)

Descriptive Statistics: Dependent Variable: GRPSAT

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.2292	.9562	12
		Total	6.2292	.9562	12
	1.00	1.00	6.2917	.5823	12
		Total	6.2917	.5823	12
	Total	1.00	6.2604	.7749	24
		Total	6.2604	.7749	24
1.00	.00	1.00	5.6875	.9601	12
		Total	5.6875	.9601	12
	1.00	1.00	6.3542	.4053	12
		Total	6.3542	.4053	12
	Total	1.00	6.0208	.7971	24
		Total	6.0208	.7971	24
2.00	.00	1.00	5.9375	1.1487	12
		Total	5.9375	1.1487	12
	1.00	1.00	6.4286	.4847	14
		Total	6.4286	.4847	14
	Total	1.00	6.2019	.8747	26
		Total	6.2019	.8747	26
Total	.00	1.00	5.9514	1.0209	36
		Total	5.9514	1.0209	36
	1.00	1.00	6.3618	.4852	38
		Total	6.3618	.4852	38
	Total	1.00	6.1622	.8134	74
		Total	6.1622	.8134	74

Descriptive Statistics: Dependent Variable: GRPSAT

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.2292	.9562	12
		Total	6.2292	.9562	12
	1.00	1.00	5.6875	.9601	12
		Total	5.6875	.9601	12
	2.00	1.00	5.9375	1.1487	12
		Total	5.9375	1.1487	12
	Total	1.00	5.9514	1.0209	36
		Total	5.9514	1.0209	36
1.00	.00	1.00	6.2917	.5823	12
		Total	6.2917	.5823	12
	1.00	1.00	6.3542	.4053	12
		Total	6.3542	.4053	12
	2.00	1.00	6.4286	.4847	14
		Total	6.4286	.4847	14
	Total	1.00	6.3618	.4852	38
		Total	6.3618	.4852	38
Total	.00	1.00	6.2604	.7749	24
		Total	6.2604	.7749	24
	1.00	1.00	6.0208	.7971	24
		Total	6.0208	.7971	24
	2.00	1.00	6.2019	.8747	26
		Total	6.2019	.8747	26
	Total	1.00	6.1622	.8134	74
		Total	6.1622	.8134	74

4.4.4 Ease of Use

Tests of Between-Subjects Effects
Dependent Variable: EOU

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	6.296(a)	11	.572	1.969	.036	.137
Intercept	5684.876	1	5684.876	19558.998	.000	.993
ALIGN	1.379	2	.690	2.373	.097	.034
LOCATION	.354	1	.354	1.218	.272	.009
VIDEO	.607	1	.607	2.089	.151	.015
ALIGN * LOCATION	.318	2	.159	.547	.580	.008
ALIGN * VIDEO	1.163	2	.582	2.001	.139	.029
LOCATION * VIDEO	.773	1	.773	2.661	.105	.019
ALIGN * LOCATION * VIDEO	1.848	2	.924	3.178	.045	.045
Error	39.529	136	.291			
Total	5797.944	148				
Corrected Total	45.824	147				

a R Squared = .137 (Adjusted R Squared = .068)

4.4.4 Ease of Use Without Video

Tests of Between-Subjects Effects Dependent Variable: EOU

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2.219(a)	5	.444	1.778	.129	.116
Intercept	2887.481	1	2887.481	11571.759	.000	.994
ALIGN	1.569	2	.785	3.144	.049	.085
LOCATION	4.027E-02	1	4.027E-02	.161	.689	.002
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.767	2	.383	1.536	.223	.043
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	16.968	68	.250			
Total	2960.028	74				
Corrected Total	19.187	73				

a R Squared = .116 (Adjusted R Squared = .051)

Descriptive Statistics: Dependent Variable: EOU

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.3214	.5864	14
		Total	6.3214	.5864	14
	1.00	.00	6.5000	.5021	14
		Total	6.5000	.5021	14
	Total	.00	6.4107	.5434	28
		Total	6.4107	.5434	28
1.00	.00	.00	6.3750	.4827	12
		Total	6.3750	.4827	12
	1.00	.00	6.3750	.3188	12
		Total	6.3750	.3188	12
	Total	.00	6.3750	.4000	24
		Total	6.3750	.4000	24
2.00	.00	.00	6.2361	.5794	12
		Total	6.2361	.5794	12
	1.00	.00	5.9167	.4530	10
		Total	5.9167	.4530	10
	Total	.00	6.0909	.5388	22
		Total	6.0909	.5388	22
Total	.00	.00	6.3114	.5413	38
		Total	6.3114	.5413	38
	1.00	.00	6.2963	.4881	36
		Total	6.2963	.4881	36
	Total	.00	6.3041	.5127	74
		Total	6.3041	.5127	74

Descriptive Statistics: Dependent Variable: EOU

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	6.3214	.5864	14
		Total	6.3214	.5864	14
	1.00	.00	6.3750	.4827	12
		Total	6.3750	.4827	12
	2.00	.00	6.2361	.5794	12
		Total	6.2361	.5794	12
	Total	.00	6.3114	.5413	38
		Total	6.3114	.5413	38
1.00	.00	.00	6.5000	.5021	14
		Total	6.5000	.5021	14
	1.00	.00	6.3750	.3188	12
		Total	6.3750	.3188	12
	2.00	.00	5.9167	.4530	10
		Total	5.9167	.4530	10
	Total	.00	6.2963	.4881	36
		Total	6.2963	.4881	36
Total	.00	.00	6.4107	.5434	28
		Total	6.4107	.5434	28
	1.00	.00	6.3750	.4000	24
		Total	6.3750	.4000	24
	2.00	.00	6.0909	.5388	22
		Total	6.0909	.5388	22
	Total	.00	6.3041	.5127	74
		Total	6.3041	.5127	74

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			EOU
Level 1 vs. Later	Contrast Estimate		.185
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.185
	Std. Error		.120
	Sig.		.127
	95% Confidence Interval for Difference	Lower Bound	-5.419E-02
		Upper Bound	.424
Level 2 vs. Level 3	Contrast Estimate		.299
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		.299
	Std. Error		.148
	Sig.		.047
	95% Confidence Interval for Difference	Lower Bound	3.756E-03
		Upper Bound	.593

Test Results
Dependent Variable: EOU

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	1.569	2	.785	3.144	.049	.085	6.289	.585
Error	16.968	68	.250					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: EOU
Bonferroni

					95% Confidence Interval	
(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	3.571E-02	.1390	1.000	-.3054	.3768
	2.00	.3198	.1423	.084	-2.9531E-02	.6691
1.00	.00	-3.5714E-02	.1390	1.000	-.3768	.3054
	2.00	.2841	.1474	.175	-7.7827E-02	.6460
2.00	.00	-.3198	.1423	.084	-.6691	2.953E-02
	1.00	-.2841	.1474	.175	-.6460	7.783E-02

Based on observed means.

4.4.4 Ease of Use With Video

Tests of Between-Subjects Effects Dependent Variable: EOU

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	3.355(a)	5	.671	2.023	.086	.129
Intercept	2797.566	1	2797.566	8432.062	.000	.992
ALIGN	.881	2	.441	1.328	.272	.038
LOCATION	1.092	1	1.092	3.292	.074	.046
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	1.335	2	.667	2.011	.142	.056
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	22.561	68	.332			
Total	2837.917	74				
Corrected Total	25.916	73				

a R Squared = .129 (Adjusted R Squared = .065)

Descriptive Statistics: Dependent Variable: EOU

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.3611	.4597	12
		Total	6.3611	.4597	12
	1.00	1.00	6.2222	.5092	12
		Total	6.2222	.5092	12
	Total	1.00	6.2917	.4797	24
		Total	6.2917	.4797	24
1.00	.00	1.00	5.7917	.7691	12
		Total	5.7917	.7691	12
	1.00	1.00	6.2500	.5000	12
		Total	6.2500	.5000	12
	Total	1.00	6.0208	.6762	24
		Total	6.0208	.6762	24
2.00	.00	1.00	5.9583	.7076	12
		Total	5.9583	.7076	12
	1.00	1.00	6.3690	.4490	14
		Total	6.3690	.4490	14
	Total	1.00	6.1795	.6072	26
		Total	6.1795	.6072	26
Total	.00	1.00	6.0370	.6844	36
		Total	6.0370	.6844	36
	1.00	1.00	6.2851	.4760	38
		Total	6.2851	.4760	38
	Total	1.00	6.1644	.5958	74
		Total	6.1644	.5958	74

Descriptive Statistics: Dependent Variable: EOU

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	6.3611	.4597	12
		Total	6.3611	.4597	12
	1.00	1.00	5.7917	.7691	12
		Total	5.7917	.7691	12
	2.00	1.00	5.9583	.7076	12
		Total	5.9583	.7076	12
	Total	1.00	6.0370	.6844	36
		Total	6.0370	.6844	36
1.00	.00	1.00	6.2222	.5092	12
		Total	6.2222	.5092	12
	1.00	1.00	6.2500	.5000	12
		Total	6.2500	.5000	12
	2.00	1.00	6.3690	.4490	14
		Total	6.3690	.4490	14
	Total	1.00	6.2851	.4760	38
		Total	6.2851	.4760	38
Total	.00	1.00	6.2917	.4797	24
		Total	6.2917	.4797	24
	1.00	1.00	6.0208	.6762	24
		Total	6.0208	.6762	24
	2.00	1.00	6.1795	.6072	26
		Total	6.1795	.6072	26
	Total	1.00	6.1644	.5958	74
		Total	6.1644	.5958	74

4.5 User Behavior

Tests of Between-Subjects Effects
Dependent Variable: DATAP

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	1717.662(a)	11	156.151	5.196	.000	.299
Intercept	30056.609	1	30056.609	1000.228	.000	.882
ALIGN	116.860	2	58.430	1.944	.147	.028
LOCATION	83.966	1	83.966	2.794	.097	.020
VIDEO	997.326	1	997.326	33.189	.000	.199
ALIGN * LOCATION	112.989	2	56.495	1.880	.157	.027
ALIGN * VIDEO	122.533	2	61.266	2.039	.134	.030
LOCATION * VIDEO	33.720	1	33.720	1.122	.291	.008
ALIGN * LOCATION * VIDEO	234.866	2	117.433	3.908	.022	.055
Error	4026.667	134	30.050			
Total	36296.000	146				
Corrected Total	5744.329	145				

a R Squared = .299 (Adjusted R Squared = .241)

Descriptive Statistics

Dependent Variable: DATAP

VIDEO	LOCATION	ALIGN	Mean	Std. Deviation	N
.00	.00	.00	15.5714	5.7340	14
		1.00	17.6000	4.4522	10
		2.00	17.1667	2.4433	12
		Total	16.6667	4.4721	36
	1.00	.00	18.7143	4.1774	14
		1.00	20.5000	2.0671	12
		2.00	12.8000	6.9410	10
		Total	17.6667	5.4929	36
	Total	.00	17.1429	5.1763	28
		1.00	19.1818	3.5941	22
		2.00	15.1818	5.3598	22
		Total	17.1667	4.9986	72
1.00	.00	.00	13.5000	8.1296	12
		1.00	8.6667	5.7102	12
		2.00	9.5000	7.0518	12
		Total	10.5556	7.1572	36
	1.00	.00	12.3333	5.7102	12
		1.00	13.6667	5.8049	12
		2.00	13.1429	4.6881	14
		Total	13.0526	5.2656	38
	Total	.00	12.9167	6.8962	24
		1.00	11.1667	6.1832	24
		2.00	11.4615	6.0612	26
		Total	11.8378	6.3398	74
Total	.00	.00	14.6154	6.8765	26
		1.00	12.7273	6.8046	22
		2.00	13.3333	6.4785	24
		Total	13.6111	6.6768	72
	1.00	.00	15.7692	5.8262	26
		1.00	17.0833	5.5082	24
		2.00	13.0000	5.5950	24
		Total	15.2973	5.8233	74
	Total	.00	15.1923	6.3371	52
		1.00	15.0000	6.4773	46
		2.00	13.1667	5.9905	48
		Total	14.4658	6.2941	146

4.5 User Behavior Without Video

Tests of Between-Subjects Effects Dependent Variable: DATAP

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	395.048(a)	5	79.010	3.782	.005	.223
Intercept	20560.393	1	20560.393	984.070	.000	.937
ALIGN	180.684	2	90.342	4.324	.017	.116
LOCATION	5.514	1	5.514	.264	.609	.004
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	208.077	2	104.039	4.980	.010	.131
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	1378.952	66	20.893			
Total	22992.000	72				
Corrected Total	1774.000	71				

a R Squared = .223 (Adjusted R Squared = .164)

Descriptive Statistics Dependent Variable: DATAP

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	15.5714	5.7340	14
		Total	15.5714	5.7340	14
	1.00	.00	18.7143	4.1774	14
		Total	18.7143	4.1774	14
	Total	.00	17.1429	5.1763	28
		Total	17.1429	5.1763	28
1.00	.00	.00	17.6000	4.4522	10
		Total	17.6000	4.4522	10
	1.00	.00	20.5000	2.0671	12
		Total	20.5000	2.0671	12
	Total	.00	19.1818	3.5941	22
		Total	19.1818	3.5941	22
2.00	.00	.00	17.1667	2.4433	12
		Total	17.1667	2.4433	12
	1.00	.00	12.8000	6.9410	10
		Total	12.8000	6.9410	10
	Total	.00	15.1818	5.3598	22
		Total	15.1818	5.3598	22
Total	.00	.00	16.6667	4.4721	36
		Total	16.6667	4.4721	36
	1.00	.00	17.6667	5.4929	36
		Total	17.6667	5.4929	36
	Total	.00	17.1667	4.9986	72
		Total	17.1667	4.9986	72

Descriptive Statistics: Dependent Variable: DATAP

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	15.5714	5.7340	14
		Total	15.5714	5.7340	14
	1.00	.00	17.6000	4.4522	10
		Total	17.6000	4.4522	10
	2.00	.00	17.1667	2.4433	12
		Total	17.1667	2.4433	12
	Total	.00	16.6667	4.4721	36
		Total	16.6667	4.4721	36
1.00	.00	.00	18.7143	4.1774	14
		Total	18.7143	4.1774	14
	1.00	.00	20.5000	2.0671	12
		Total	20.5000	2.0671	12
	2.00	.00	12.8000	6.9410	10
		Total	12.8000	6.9410	10
	Total	.00	17.6667	5.4929	36
		Total	17.6667	5.4929	36
Total	.00	.00	17.1429	5.1763	28
		Total	17.1429	5.1763	28
	1.00	.00	19.1818	3.5941	22
		Total	19.1818	3.5941	22
	2.00	.00	15.1818	5.3598	22
		Total	15.1818	5.3598	22
	Total	.00	17.1667	4.9986	72
		Total	17.1667	4.9986	72

4.5 User Behavior Without Video Distributed

Tests of Between-Subjects Effects
Dependent Variable: DATAP

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	28.505(a)	2	14.252	.700	.504	.041
Intercept	9946.243	1	9946.243	488.799	.000	.937
ALIGN	28.505	2	14.252	.700	.504	.041
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	671.495	33	20.348			
Total	10700.000	36				
Corrected Total	700.000	35				

a R Squared = .041 (Adjusted R Squared = -.017)

Descriptive Statistics
Dependent Variable: DATAP

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	15.5714	5.7340	14
		Total	15.5714	5.7340	14
	Total	.00	15.5714	5.7340	14
		Total	15.5714	5.7340	14
1.00	.00	.00	17.6000	4.4522	10
		Total	17.6000	4.4522	10
	Total	.00	17.6000	4.4522	10
		Total	17.6000	4.4522	10
2.00	.00	.00	17.1667	2.4433	12
		Total	17.1667	2.4433	12
	Total	.00	17.1667	2.4433	12
		Total	17.1667	2.4433	12
Total	.00	.00	16.6667	4.4721	36
		Total	16.6667	4.4721	36
	Total	.00	16.6667	4.4721	36
		Total	16.6667	4.4721	36

4.5 User Behavior Without video Co-Located

Tests of Between-Subjects Effects
Dependent Variable: DATAP

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	348.543(a)	2	174.271	8.129	.001	.330
Intercept	10619.664	1	10619.664	495.364	.000	.938
ALIGN	348.543	2	174.271	8.129	.001	.330
LOCATION	.000	0	.	.	.	.000
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	.000	0	.	.	.	.000
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	707.457	33	21.438			
Total	12292.000	36				
Corrected Total	1056.000	35				

a R Squared = .330 (Adjusted R Squared = .289)

Descriptive Statistics
Dependent Variable: DATAP

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	1.00	.00	18.7143	4.1774	14
		Total	18.7143	4.1774	14
	Total	.00	18.7143	4.1774	14
		Total	18.7143	4.1774	14
1.00	1.00	.00	20.5000	2.0671	12
		Total	20.5000	2.0671	12
	Total	.00	20.5000	2.0671	12
		Total	20.5000	2.0671	12
2.00	1.00	.00	12.8000	6.9410	10
		Total	12.8000	6.9410	10
	Total	.00	12.8000	6.9410	10
		Total	12.8000	6.9410	10
Total	1.00	.00	17.6667	5.4929	36
		Total	17.6667	5.4929	36
	Total	.00	17.6667	5.4929	36
		Total	17.6667	5.4929	36

Contrast Results (K Matrix)

			Dependent Variable
ALIGN Helmert Contrast			DATAP
Level 1 vs. Later	Contrast Estimate		2.064
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		2.064
	Std. Error		1.586
	Sig.		.202
	95% Confidence Interval for Difference	Lower Bound	-1.161
		Upper Bound	5.290
Level 2 vs. Level 3	Contrast Estimate		7.700
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		7.700
	Std. Error		1.983
	Sig.		.000
	95% Confidence Interval for Difference	Lower Bound	3.667
		Upper Bound	11.733

Test Results
Dependent Variable: DATAP

Source	Sum of Squares	df	Mean Square	F	Sig.	Eta Squared	Noncent. Parameter	Observed Power(a)
Contrast	348.543	2	174.271	8.129	.001	.330	16.258	.941
Error	707.457	33	21.438					

a Computed using alpha = .05

Multiple Comparisons
Dependent Variable: DATAP
Bonferroni

					95% Confidence Interval	
(I) ALIGN	(J) ALIGN	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	-1.7857	1.8215	1.000	-6.3799	2.8085
	2.00	5.9143(*)	1.9171	.012	1.0791	10.7495
1.00	.00	1.7857	1.8215	1.000	-2.8085	6.3799
	2.00	7.7000(*)	1.9825	.001	2.6997	12.7003
2.00	.00	-5.9143(*)	1.9171	.012	-10.7495	-1.0791
	1.00	-7.7000(*)	1.9825	.001	-12.7003	-2.6997

Based on observed means.

* The mean difference is significant at the .05 level.

4.5 User Behavior With Video

Tests of Between-Subjects Effects Dependent Variable: DATAP

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	286.340(a)	5	57.268	1.471	.211	.098
Intercept	10272.562	1	10272.562	263.825	.000	.795
ALIGN	45.465	2	22.732	.584	.561	.017
LOCATION	114.513	1	114.513	2.941	.091	.041
VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION	126.598	2	63.299	1.626	.204	.046
ALIGN * VIDEO	.000	0	.	.	.	.000
LOCATION * VIDEO	.000	0	.	.	.	.000
ALIGN * LOCATION * VIDEO	.000	0	.	.	.	.000
Error	2647.714	68	38.937			
Total	13304.000	74				
Corrected Total	2934.054	73				

a R Squared = .098 (Adjusted R Squared = .031)

Descriptive Statistics: Dependent Variable: DATAP

ALIGN	LOCATION	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	13.5000	8.1296	12
		Total	13.5000	8.1296	12
	1.00	1.00	12.3333	5.7102	12
		Total	12.3333	5.7102	12
	Total	1.00	12.9167	6.8962	24
		Total	12.9167	6.8962	24
1.00	.00	1.00	8.6667	5.7102	12
		Total	8.6667	5.7102	12
	1.00	1.00	13.6667	5.8049	12
		Total	13.6667	5.8049	12
	Total	1.00	11.1667	6.1832	24
		Total	11.1667	6.1832	24
2.00	.00	1.00	9.5000	7.0518	12
		Total	9.5000	7.0518	12
	1.00	1.00	13.1429	4.6881	14
		Total	13.1429	4.6881	14
	Total	1.00	11.4615	6.0612	26
		Total	11.4615	6.0612	26
Total	.00	1.00	10.5556	7.1572	36
		Total	10.5556	7.1572	36
	1.00	1.00	13.0526	5.2656	38
		Total	13.0526	5.2656	38
	Total	1.00	11.8378	6.3398	74
		Total	11.8378	6.3398	74

Descriptive Statistics: Dependent Variable: DATAP

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	1.00	13.5000	8.1296	12
		Total	13.5000	8.1296	12
	1.00	1.00	8.6667	5.7102	12
		Total	8.6667	5.7102	12
	2.00	1.00	9.5000	7.0518	12
		Total	9.5000	7.0518	12
	Total	1.00	10.5556	7.1572	36
		Total	10.5556	7.1572	36
1.00	.00	1.00	12.3333	5.7102	12
		Total	12.3333	5.7102	12
	1.00	1.00	13.6667	5.8049	12
		Total	13.6667	5.8049	12
	2.00	1.00	13.1429	4.6881	14
		Total	13.1429	4.6881	14
	Total	1.00	13.0526	5.2656	38
		Total	13.0526	5.2656	38
Total	.00	1.00	12.9167	6.8962	24
		Total	12.9167	6.8962	24
	1.00	1.00	11.1667	6.1832	24
		Total	11.1667	6.1832	24
	2.00	1.00	11.4615	6.0612	26
		Total	11.4615	6.0612	26
	Total	1.00	11.8378	6.3398	74
		Total	11.8378	6.3398	74

4.6 Decision Quality

Tests of Between-Subjects Effects
Dependent Variable: TOTALPTS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	3.206(a)	11	.291	2.187	.018	.150
Intercept	7744.124	1	7744.124	58108.136	.000	.998
ALIGN	.457	2	.229	1.715	.184	.025
LOCATION	.586	1	.586	4.397	.038	.031
VIDEO	.442	1	.442	3.320	.071	.024
ALIGN * LOCATION	.465	2	.232	1.744	.179	.025
ALIGN * VIDEO	.462	2	.231	1.733	.181	.025
LOCATION * VIDEO	.342	1	.342	2.569	.111	.019
ALIGN * LOCATION * VIDEO	.470	2	.235	1.762	.176	.025
Error	18.125	136	.133			
Total	7831.293	148				
Corrected Total	21.331	147				

a R Squared = .150 (Adjusted R Squared = .082)

Descriptive Statistics
Dependent Variable: TOTALPTS

LOCATION	ALIGN	VIDEO	Mean	Std. Deviation	N
.00	.00	.00	7.2854	.1019	14
		1.00	7.2357	.2068	12
		Total	7.2625	.1577	26
	1.00	.00	7.3191	4.821E-02	12
		1.00	7.2774	.1925	12
		Total	7.2983	.1389	24
	2.00	.00	7.3052	9.642E-02	12
		1.00	6.7774	1.2398	12
		Total	7.0413	.9012	24
	Total	.00	7.3023	8.547E-02	38
		1.00	7.0968	.7490	36
		Total	7.2023	.5323	74
1.00	.00	.00	7.3330	.0000	14
		1.00	7.3192	4.792E-02	12
		Total	7.3266	3.256E-02	26
	1.00	.00	7.3330	.0000	12
		1.00	7.3191	4.821E-02	12
		Total	7.3260	3.409E-02	24
	2.00	.00	7.3330	.0000	10
		1.00	7.3211	4.437E-02	14
		Total	7.3261	3.388E-02	24
	Total	.00	7.3330	.0000	36
		1.00	7.3199	4.546E-02	38
		Total	7.3263	3.303E-02	74
Total	.00	.00	7.3092	7.474E-02	28
		1.00	7.2774	.1529	24
		Total	7.2945	.1173	52
	1.00	.00	7.3260	3.409E-02	24
		1.00	7.2983	.1389	24
		Total	7.3121	.1010	48
	2.00	.00	7.3178	7.121E-02	22
		1.00	7.0702	.8682	26
		Total	7.1837	.6471	48
	Total	.00	7.3172	6.278E-02	74
		1.00	7.2114	.5316	74
		Total	7.2643	.3809	148

Descriptive Statistics
Dependent Variable: TOTALPTS

VIDEO	LOCATION	ALIGN	Mean	Std. Deviation	N
.00	.00	.00	7.2854	.1019	14
		1.00	7.3191	4.821E-02	12
		2.00	7.3052	9.642E-02	12
		Total	7.3023	8.547E-02	38
	1.00	.00	7.3330	.0000	14
		1.00	7.3330	.0000	12
		2.00	7.3330	.0000	10
		Total	7.3330	.0000	36
	Total	.00	7.3092	7.474E-02	28
		1.00	7.3260	3.409E-02	24
		2.00	7.3178	7.121E-02	22
		Total	7.3172	6.278E-02	74
1.00	.00	.00	7.2357	.2068	12
		1.00	7.2774	.1925	12
		2.00	6.7774	1.2398	12
		Total	7.0968	.7490	36
	1.00	.00	7.3192	4.792E-02	12
		1.00	7.3191	4.821E-02	12
		2.00	7.3211	4.437E-02	14
		Total	7.3199	4.546E-02	38
	Total	.00	7.2774	.1529	24
		1.00	7.2983	.1389	24
		2.00	7.0702	.8682	26
		Total	7.2114	.5316	74
Total	.00	.00	7.2625	.1577	26
		1.00	7.2983	.1389	24
		2.00	7.0413	.9012	24
		Total	7.2023	.5323	74
	1.00	.00	7.3266	3.256E-02	26
		1.00	7.3260	3.409E-02	24
		2.00	7.3261	3.388E-02	24
		Total	7.3263	3.303E-02	74
	Total	.00	7.2945	.1173	52
		1.00	7.3121	.1010	48
		2.00	7.1837	.6471	48
		Total	7.2643	.3809	148

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Vita

Captain Brian J. Heberlie was born on 2 March 1968 in Crystal City, Missouri. He graduated from North County High School in Desloge, Missouri in May 1986. He completed his undergraduate studies at Southeast Missouri State University in Cape Girardeau, Missouri in August 1992. He was commissioned through the Officer Training School, Maxwell Air Force Base, Alabama, on 15 March 1994.

Captain Heberlie's first assignment was to the 509th Support Group, Whiteman Air Force Base, Missouri in May 1994, where he served as the executive officer to the 509th Support Group Commander. In March of 1996, he was assigned to the 509th Communications Squadron as the Squadron Section Commander. In March 1997, he was reassigned in the 509th Communications Squadron as the information support flight commander. In October 1997, he was reassigned to the 509th Support Group where he again served as the executive officer to the 509th Support Group Commander. In May 1998, he entered the Graduate Information Resource Management program, School of Logistics and Acquisition Management, Air Force Institute of Technology. Upon graduation, he will be assigned to U.S. Air Forces in Europe, Ramstein AB, Germany.

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Vita

Captain Mary O. Tolbert was born on 20 July 1971 in Seoul, Korea. She graduated from Monterey High School in Monterey, California in May 1989. In September of that year she entered undergraduate studies at the University of California at Davis where she graduated with a Bachelor of Arts degree in International Relations on 18 June 1993.

After receiving her commission through AFROTC at Detachment 088, California State University Sacramento on 18 June 1993, Captain Tolbert was stationed at the University of California at Berkeley, where for the period of one year she was assigned as the AFROTC Assistant Regional Director of Admissions for the northwest region. In May of 1994, she was reassigned to Ramstein Airbase, Germany, where she served as the squadron section commander for the USAFE Computer Systems Squadron. In April of 1995 she was reassigned to the 1st Combat Communications Squadron, as the squadron section commander. In April of 1996, she moved to the 32nd Air Operations Squadron (32AOS) as the executive officer. While assigned to 32AOS, she was deployed in May 1997 to spend five months in Vicenza, Italy as the Fifth Tactical Air Force and Combined Air Operations Center protocol officer. She returned to 32AOS as the deputy chief of Theater Battle Management Systems. In May 1998, she entered the Graduate Information Resource Management program, School of Logistics and Acquisition Management, Air Force Institute of Technology. Upon graduation, she will be assigned to the Standard Systems Group, Maxwell AFB-Gunter Annex, Alabama.

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13. ABSTRACT (*Maximum 200 Words*)

The growth of distributed group support systems (GSS) suggests that organizations will continue to bring dispersed groups of people together to make decisions over computer networks. In many instances those groups are temporarily assembled to address a task and then summarily disbanded never to work together again. In order for users to effectively use the GSS, issues of trust and control need to be addressed within the GSS design. Users have perceptions about the fairness of structural and social determinants of the GSS design. These perceptions influence both the decision-making process and process outcomes. This article shows the negative impacts that facilitator alignment and co-location with a single meeting member has on the other group members' perception of GSS fairness and equality of power distribution. This study also demonstrated how video could effectively reduce or mitigate the negative justice perceptions that users experience from facilitator alignment and co-location. The findings suggest that the increased communications capabilities available from video can help users overcome limitations that would otherwise be present from the design.

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